148

NO. 148

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The suffix letter "A," following the Folder number, indicates a "Preliminary Data Folder," designed to provide immediately data on television receivers—pending coverage in standard PHOTOFACT Form.

The PHOTOFACT Servicer

October 15, 1951 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ Vol. 15, Nos. 147 & 148

Thought for the month: We stumble oftenest when we look down, not up. -Anon.

INDUSTRY AND TRADE NEWS

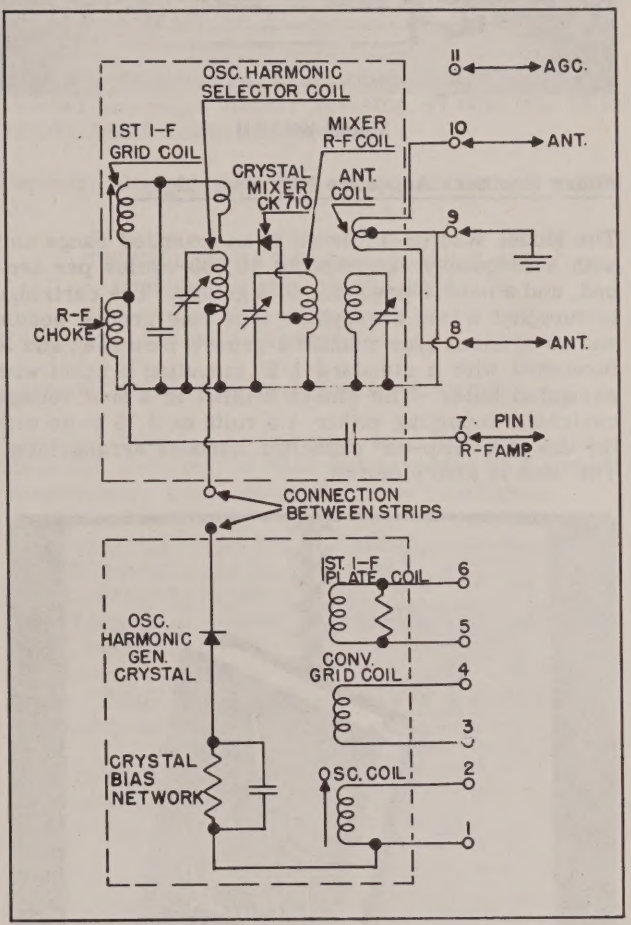
UHF Conversion -

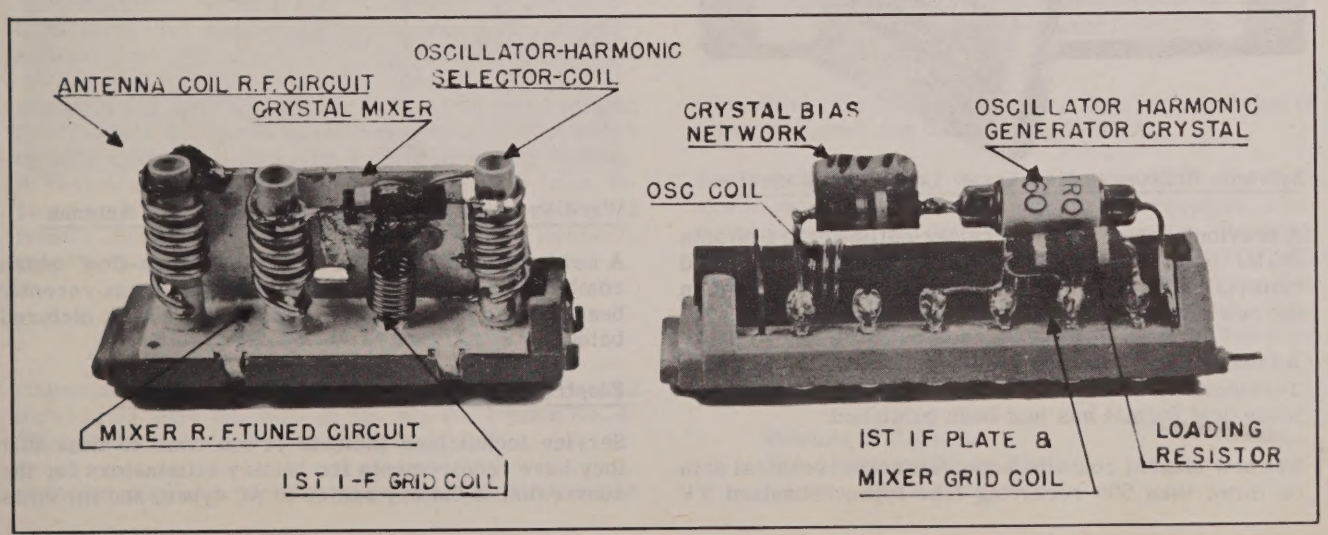
Typical of the work manufacturers are doing to enable reception of UHF channels is that reporduced herein from the latest Capehart Service Bulletin. The tuner is the Standard Coil type, and the conversion is simply the addition of UHF Channel Strips. This unit was successfully demonstrated recently in Bridgeport, Conn., with a standard Capehart CX-33 chassis. A schematic of the strips as well as photographs are shown.

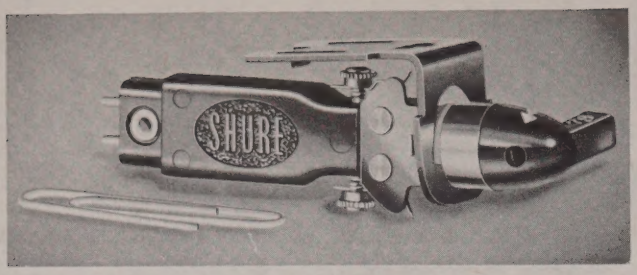
The only modification made to this chassis to enable it to receive UHF signals was the addition of UHF Channel Strips in an unused VHF strip position in the tuner turret. The strip is in two sections (as is the VHF strip) which contains all of the required components to complete the conversion, no additional tubes are required.

One section of the UHF strip includes the antenna input circuit, a crystal mixer and its tuned circuit and a 1st IF grid coil. The second section consists of the coils for the 1st IF plate, convertor grid and the oscillator plus a crystal harmonic generator and its bias network.

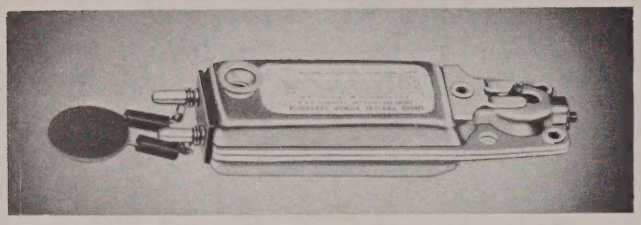
In operation, the UHF signal is fed into the balanced antenna input coil and is then coupled into the mixer circuit where it is mixed with an oscillator frequency, (a harmonic of the fundamental oscillator frequency) to produce an IF frequency which falls in the spectrum between the two present VHF television bands. This IF frequency is then coupled into the grid of the RF amplifier, which in this case acts as a 1st IF amplifier. The amplified IF signal is then coupled into the mixer circuit where the fundamental oscillator frequency mixes with it to produce the regular IF frequency of the receiver. The functions of the receiver from this point on then are the same for VHF reception.







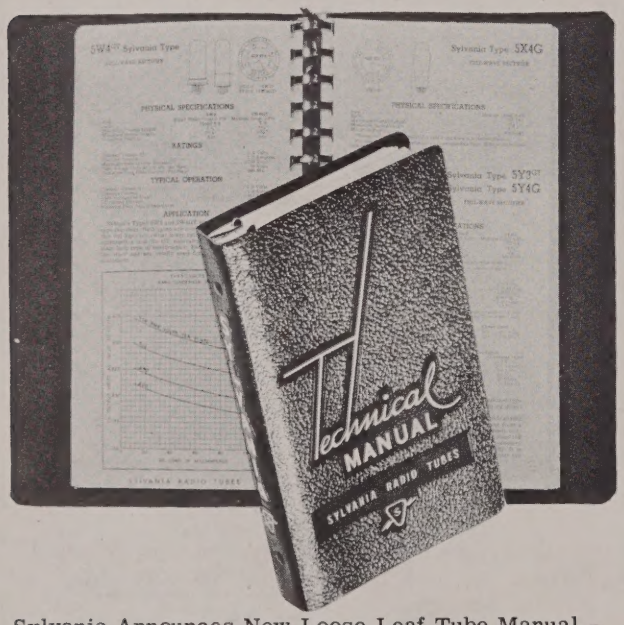
Model W-22AB-T



Model W42BH

Shure Brothers Announce New Cartridges -

The Model W22AB-T shown is an extended range unit with a frequency response to 10,000 cycles per second, and a needle pressure of 8 grams. The cartridge is supplied with a sapphire type fine-groove needle and an osmium type standard-groove needle, and is furnished with a standard 1/2" mounting bracket with elongated holes. The Model W42BH is a dual voltage cartridge supplying either 1.5 volts or 3.75 volts with the use of a "slip-on" capacitor harness arrangement. This unit is also pictured.



Sylvania Announces New Loose Leaf Tube Manual -

A previous issue of the Servicer outlined the Sylvania dealer program for the supplying of service aids and material. Further information has been released in the new tube manual.

A revised and enlarged eighth edition of the Sylvania Technical Manual in a completely new "snap-open" loose-leaf format has just been published.

The new Manual contains comprehensive technical data on more than 500 receiving tube types, standard TV picture tubes, as well as 84 pages of general information on vacuum tube operation. It is furnished in a green embossed plastic fiber oover and metal multi-ring loose-leaf binder.

The engineering data section includes text of fundamental electrical laws, fundamental properties of vacuum tubes, definitions of common radio terms, general tube and circuit information, tube dimensions, information on obsolete tube types, tube base diagrams, and data on panel lamps, ballast tubes and plug-in resistors.

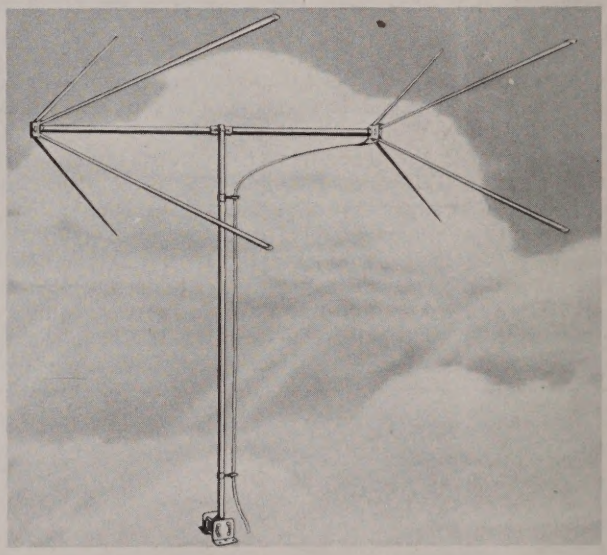
The manual is priced at $2.00 per copy and may be obtained from Sylvania Distributors or by remittance to the Advertising Department, Sylvania Electric Products Inc., Emporium, Pennsylvania.

JFD Develops New Single Channel Booster -

A new unit called the "Tuck-Away" television booster was recently introduced by the JFD Manufacturing Company. The unit features a broad band circuit and is factory pretuned for the desired channel. The dimensions of the unit are 4-1/2" by 4-3/4" by 1-3/4", and it can be installed on the rear of the television cabinet. A temperature compensated thermo-relay power switch turns the unit on and off with the operation of the TV receiver.

Stancor Announces Three Deflection Yokes -

Stancor has announced three new 70° deflection yokes of the cosine type. These units added to the distributor line are types DY-8, DY-9, DY-10. Further technical information is available at your Stancor distributor. The units will be listed in the forthcoming issues of PHOTOFACT Folders.



Ward Products Corporation Develops New Antenna -

A newly designed antenna called the "Para-Con" which combines parabolic and conical designs, has recently been added to the Ward line. The unit is pictured below.

Electro Products Laboratories Incorporated -

Service technicians indicate from time to time that they have requirements for battery eliminators for the conversion of battery radios to AC types, and for units

to use in their service operations. A comprehensive line of such units is manufactured by:

Electro Products Laboratories, Inc.
4501 North Ravenswood Avenue
Chicago 40, Illinois

Representative types are the model "S" which supplies 1.4 volts and 90 volts DC from the 115 volt AC line; the model "F", which supplies 2 volts and 67, 90, 112, and 135 volts DC from the 115 volt AC line; the model "B" which supplies from 3 to 9 volts DC, current ratings up to 35 amperes, and the model "BJ" supplies 3 to 9 volts DC and up to 25 amperes.

Many other units are included in the line and complete descriptive literature is available by writing the company at the address given above.

FIELD EXPERIENCES

For every "Field Experience" published, we issue a certificate good for one PHOTOFACT Folder Set. Awards are issued at the time of publication. Since it is impossible to verify the accuracy of contributions, we cannot be responsible for either the diagnosis made of the receiver trouble, or the results which will be obtained by following the suggested repair routine. All contributions become the property of Howard W. Sams & Co., Inc.

FADA Models S6C55, S6C70, S6T65, S7C70, S7T65, S9C10, S1055, S1055X, S1060, S1065
Photofact Set No. 134, Folder No. 7

Complaint: Vertical retrace lines show on weak signal. Picture difficult to hold on some stations. Not enough contrast.

Analysis and Repair: All voltages check O.K. A poorly soldered joint on Capacitor C-28 in the tuner was the cause of trouble.

J. S. Kreutz
Seaside Radio & Television Service
1559 Stratford Avenue
Bridgeport, Connecticut

* * *

PHILCO MODEL 46-350
Photofact Set No. 10, Folder No. 24

Complaint: Set dead due to open series filament resistor.

Analysis and Repair: After replacing this resistor the receiver developed an intermittent squeal. A check of all bypasses, filters and tubes revealed nothing. A resistance check showed a low reading from B- to chassis. After removing the isolation network I found a shorted oscillator coupling capacitor. Replacement with a 47 Mmf. mica repaired the receiver.

BENDIX MODELS 2001, 3001
Photofact Set No. 84, Folder No. 4

Complaint: This model uses a special wire wound resistor part No. R70 in Set No. 84, Folder No. 4. This resistor arcs over to chassis.

Remedy: Remove resistor from chassis and insulate using two porcelain stand-offs (the type used to elevate tube socket).

Editor's Note: Both the above Field Experiences were submitted by:

Floyd Scroggy
Jim's Radio and Television, Inc.
242 South Broad Street
Woodbury, New Jersey

* * *

ADMIRAL Chassis Model 5H1 Battery Operated
Photofact Set No. 26, Folder No. 1

Complaint: Set gives bad smell, smokes and stops playing.

Analysis: Selenium rectifier, Admiral part No. 93A1-2, shorted and surge limiter resistor, 47 ohm (No. 42 in PHOTOFACT Folder) burned out.

Remedy: Replace defective parts and the set will be O.K.

TEMPLE Radio Receiver, Model G-419
Photofact Set No. 26, Folder No. 25

Complaint: Intermittent reception.

Analysis: Shorted IF Transformer Trimmer.

Remedy: This transformer was replaced with a Meissner Part No. 16-6658 and it cured the trouble immediately. Connections are made as follows:

Blue lead to pin No. 3 of 12SA7,
Red lead to pin No. 4 of 12SA7,
Green lead to pin of 12SQ7,
Black lead to AVC (ungrounded side of volume control).

Editor's Note: Both the above Field Experiences were submitted by:

Donat A. Duquet
10 Monument St.
Winslow, Maine

* * *

GENERAL ELECTRIC MODELS 805, 806 807, 808, 809, 821
Photofact Set No. 78, Folder No. 7

Complaint: No sound or raster. One series string of tubes is lighted the other string is dark.

Analysis and Repair: Since resistors R107 and R108 are in individual series strings in this receiver it became apparent that one of these was open. Replacement with the items recommended in PHOTOFACT Folders repaired the receiver. For preventive reasons we replaced both resistors at the same time. Incidentally, both of these resistors are located inside the high voltage cage as shown on page 9 of PHOTOFACT Folder.

Howard S. Costello
724 Allegheny River Blvd.
Verona, Pennsylvania

GENERAL ELECTRIC PORTABLE MODEL 165
Photofact Set No. 89, Folder No. 7

Complaint: Overloading and distortion on strong or local sig. V.T.V.M. indicates 25-30 volts at top of R1 and no AVC on V1 or V2.

Analysis and Remedy: Ohmeter check reveals apparent short of A. V. C. line to B-. R4 was found to be 560 ohms and in two chassis checked it has been found to be a factory error. Replacement with 3.3 meg. as per Photofact corrects all faults. We have found this on two chassis to date.

Frank L. Dodd
Dodd Radio & Electrical Service
11 North Second Street
Lewisburg, Pennsylvania

* * *

ADMIRAL MODEL 36R46 (Chassis 21B1)
Photofact Set No. 118, Folder No. 2

Complaint: Severe horizontal pulling and weaving. Positioning of contrast, horizontal lock and horizontal hold controls had no effect.

Cause and Remedy: Leads running from power transformer to 5V4G low voltage rectifier were found passing very close to the 6AC7 video amplifier socket. Moving these leads away cleared up the trouble.

Kenneth B. Ross
623 S. Kenneth Ave.
Chicago, 24, Illinois

* * *

WESTINGHOUSE Model H-156
Photofact Set No. 35, Folder No. 25

Complaint: Intermittent operation.

Analysis: When I removed the set from cabinet, turning it upside down for inspection, the set played normally. Turning the receiver upright again, caused it to cut out. This happened two or three times, so I started tapping the tubes and IF cans. Tapping the second IF can caused the set to play normally, and inspection after the removal of the can indicated that loose strands of the grid lead were shorting to the can.

Remedy: Resoldering the lead and replacing the can effected the repair.

Albert Glick
A & B Radio & Electrical Appliances
44 Brithton 4th Ct.
Brooklyn 24, New York

* * *

RCA Model 8X-71
Photofact Set 63, Folder No. 15

Complaint: Extreme audio hum and distortion when station is tuned in.

Analysis and Repair: After checking all parts of set and tubes, as well as checking between socket pins for high resistance leakage, I found that by replacing the 19J6 tube the condition was remedied. The 19J6 tube in the set checked O.K. except it was a "hummer."

Lester G. Basham
Basham Radio Service
Cave Junction, Oregon

* * *

EMERSON 650, 654, 655D
Photofact Set No. 109, Folder No. 3

Complaint: No raster, or low brightness.

Analysis and Repair; High voltage O.K. Capacitor C75, .002, from vertical output transformer to cathode of picture tube is shorted or leaky, causing cathode to go more positive and cutting off picture tube. Replace with 600V unit.

Milton McGrath
Radio & Television Service
Gallupville, New York

* * *

TRAVELER Models 12L50, 14B50, 14C50
64R50, 16G50, 16T50
Photofact Set No. 108, Folder 13

Complaint: Very weak negative picture with contrast control almost inoperative.

Cause: 6800 ohm 5 watt video amplifier plate resistor open.

Remedy: Replace with 6800 ohm, 10 watt resistor.

RAYTHEON Chassis 16AY28, 17AY21
Photofact Set No. 124, Folder No. 8

Complaint: Sound but no raster or picture.

Cause: 270K ohm horizontal multivibrator plate resistor open.

Remedy: Replace with 270K ohm, 1 watt resistor.

SILVERTONE 110.499 Chassis
Photofact Set No. 79, Folder No. 16

Complaint: No sound--weak picture that cannot be focused.

Cause: R63, a 1500 ohm wire wound resistor in series with the focus coil, is open. This resistor supplies B+ for the sound IF amp., AF amp., and Audio output plates.

Remedy: Replace resistor with 1500 ohm 10 watt resistor.

Editor's Note: The three above Field Experiences were submitted by:

Carl R. Braunegg
Braunegg Service & Repair
311 Oakland Avenue
Charleroi, Pennsylvania

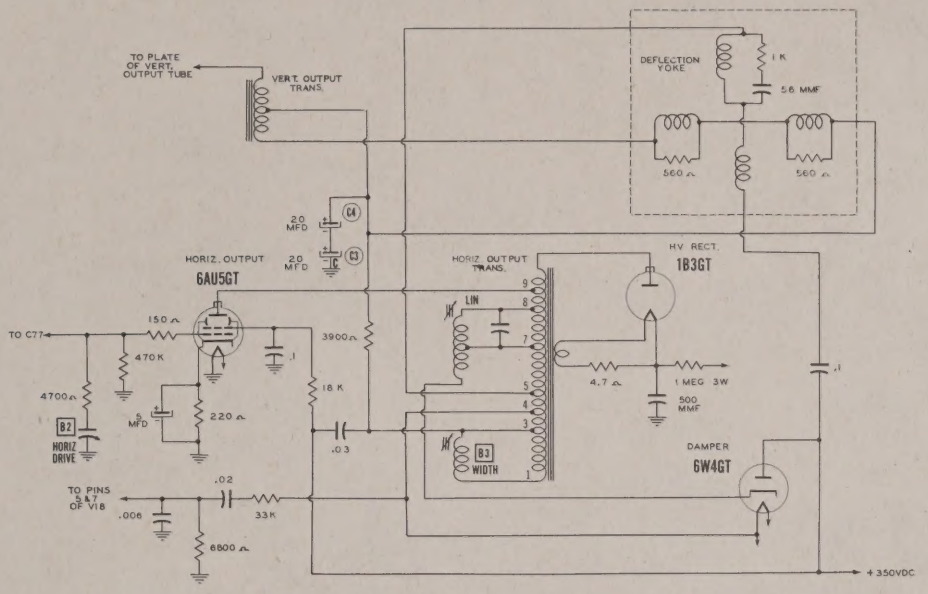
PRODUCTION CHANGES
BULLETIN 27

CONRAC MODEL 44

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 4 IN SET 140

Conrac Model 44 is identical to the Series 40 television receiver covered in Photofact Folder 4 in Set 140 except that a type 24AP4 picture tube is used along with the necessary changes required in the horizontal output circuit.

A partial schematic shows the new horizontal output circuit employed in the Model 44 receiver.



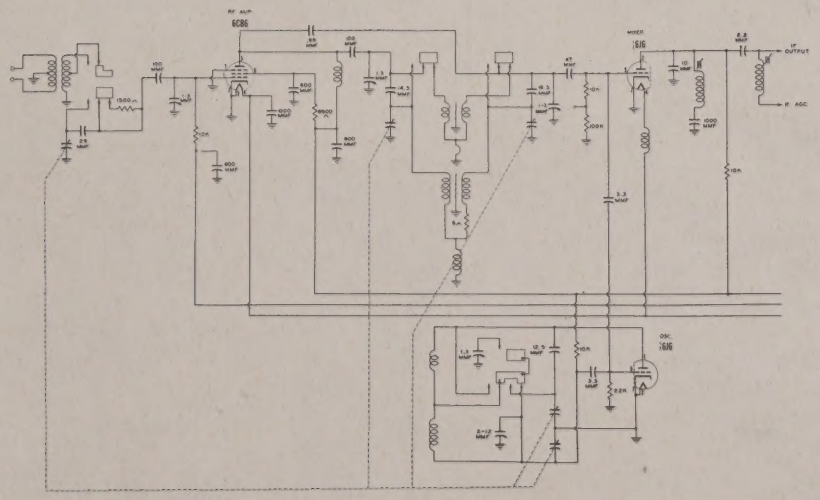
EMERSON MODEL 666B
(Ch. 120135B, 120135G, 120135H)

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 5 IN SET 133

Emerson Model 666B is used in Chassis 120135B, 120135G, and 120135H. Chassis 120135G uses a 3 tube capacitively tuned tuner. For information on this tuner see Emerson Model 661B in Photofact Folder 4 in Set 137.

Chassis 120135H uses a two tube capacitively tuned tuner. A schematic below shows the two tube unit as used with chassis 120135H.

Ch. 120135B (B), Ch. 120135G (A), Ch. 120135H (A)	The following production changes were made to improve sync. stability in fringe areas. R68 removed. A 4700Ω resistor and 2200Ω resistor were connected in series and inserted in the circuit in place of R68. The 4700Ω resistor was connected to the plate. C65 was disconnected from the plate of V14 and connected to the junction of the 4700Ω and 2200Ω resistors. R72 was changed to 1000Ω
Ch. 120135B (A), Ch. 120135G (B), Ch. 120135H (B)	R74 changed to 330Ω R72 changed to 1500Ω



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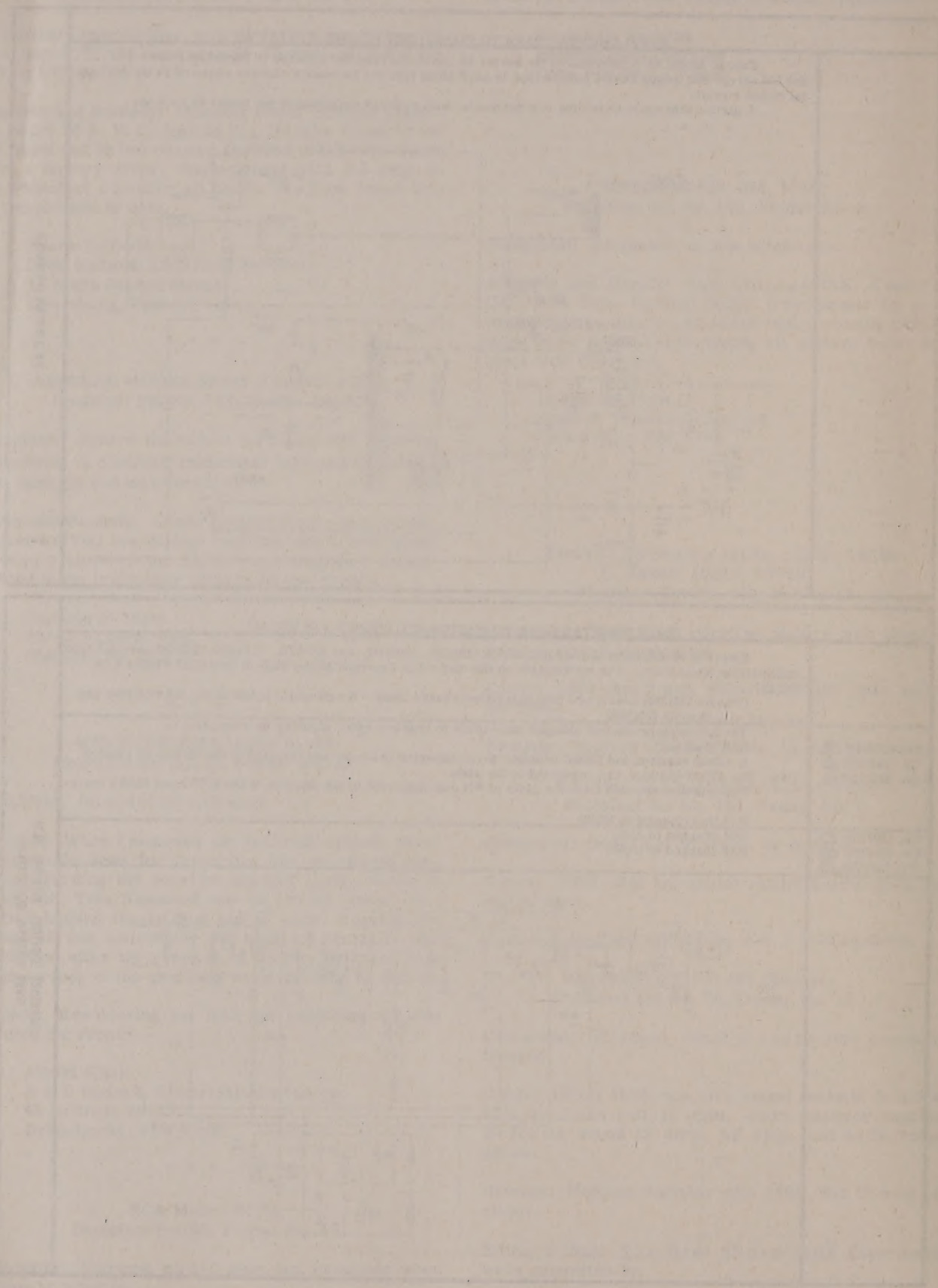

AIRLINE MODELS 05WG-3030C, 05WG-3036A, B, 05WG-3039A, B

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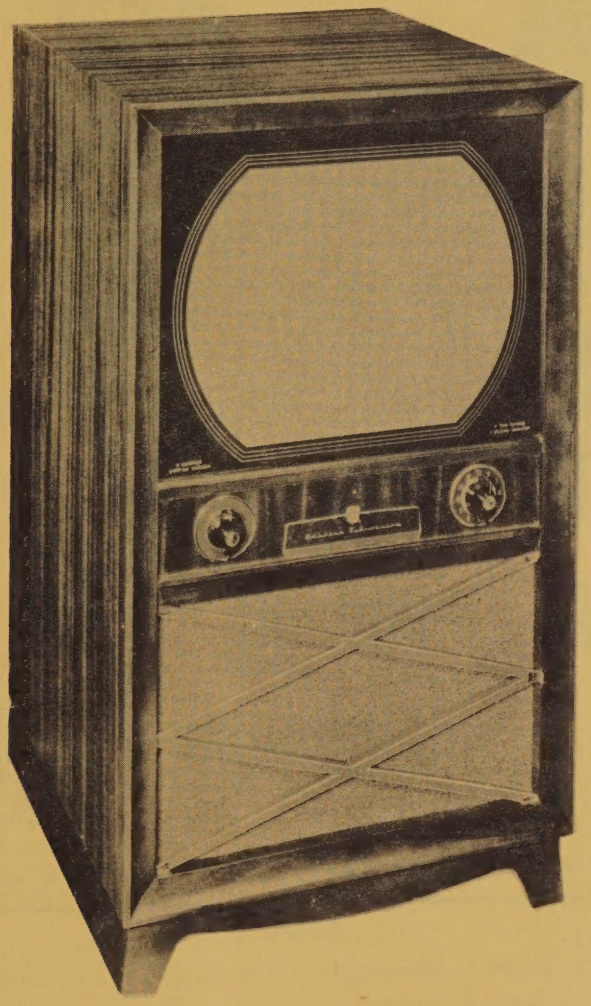
The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL 05WG-3030C

AIRLINE MODELS 05WG-3030C, 05WG-3036A, B, 05WG-3039A, B

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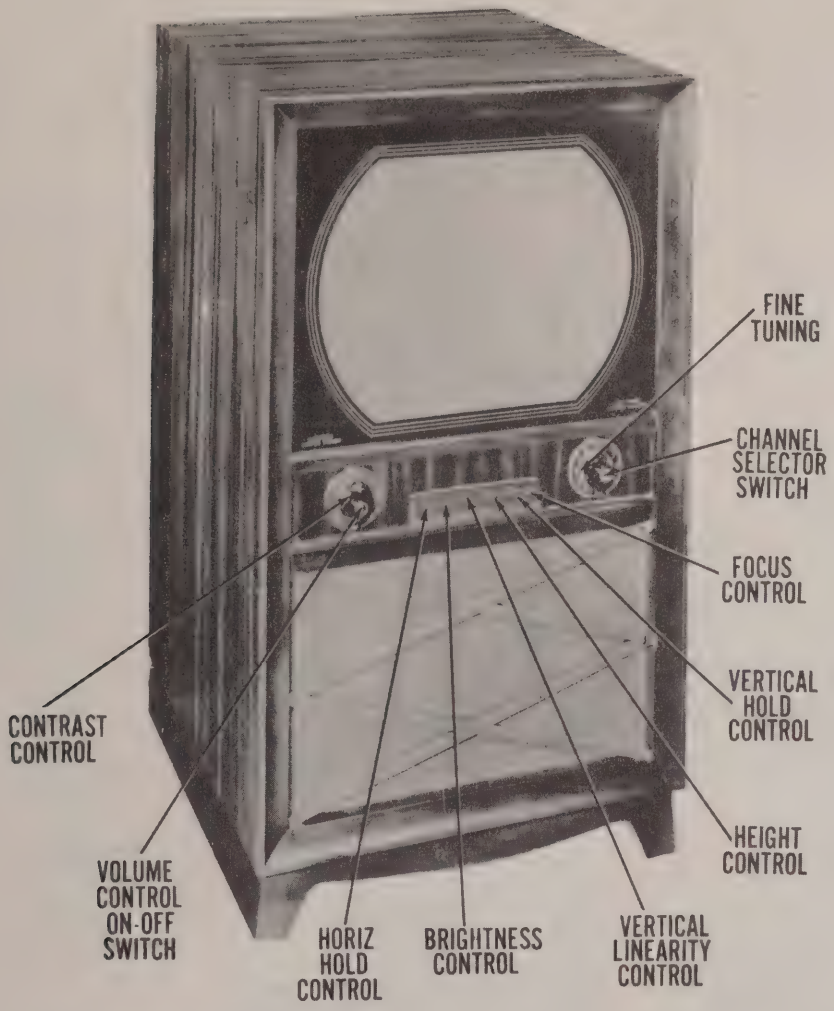
DATE 10-51 SET 148 FOLDER 2

AIRLINE MODELS 05WG-3030C, 05WG-3036A, B, 05WG-3039A, B



AIRLINE MODEL 05WG-3030C

TRADE NAME	Airline Models 05WG-3030C, 05WG-3036A, B, 05WG-3039A, B
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty Three
POWER SUPPLY	110-120 Volts AC - 60 Cycle — RATING 1.9 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13

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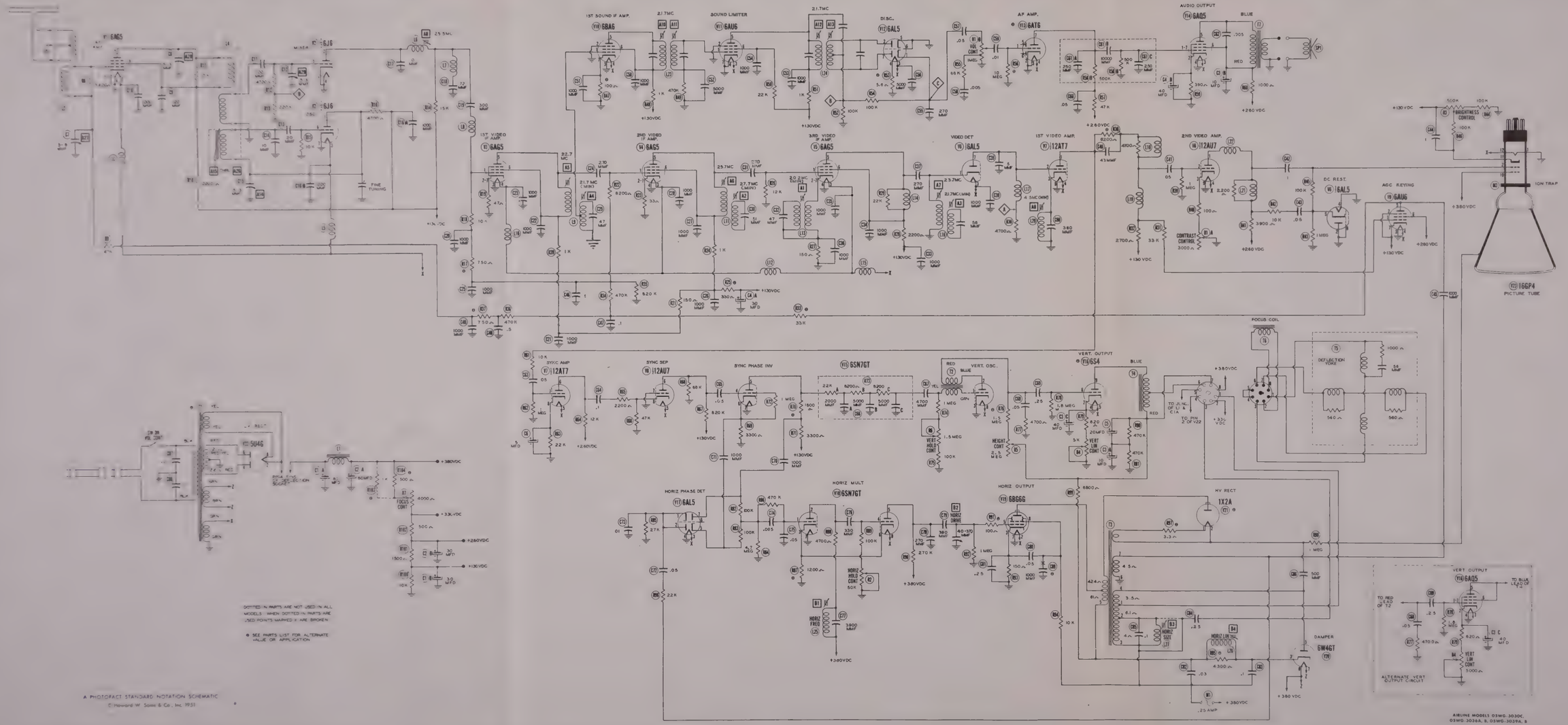
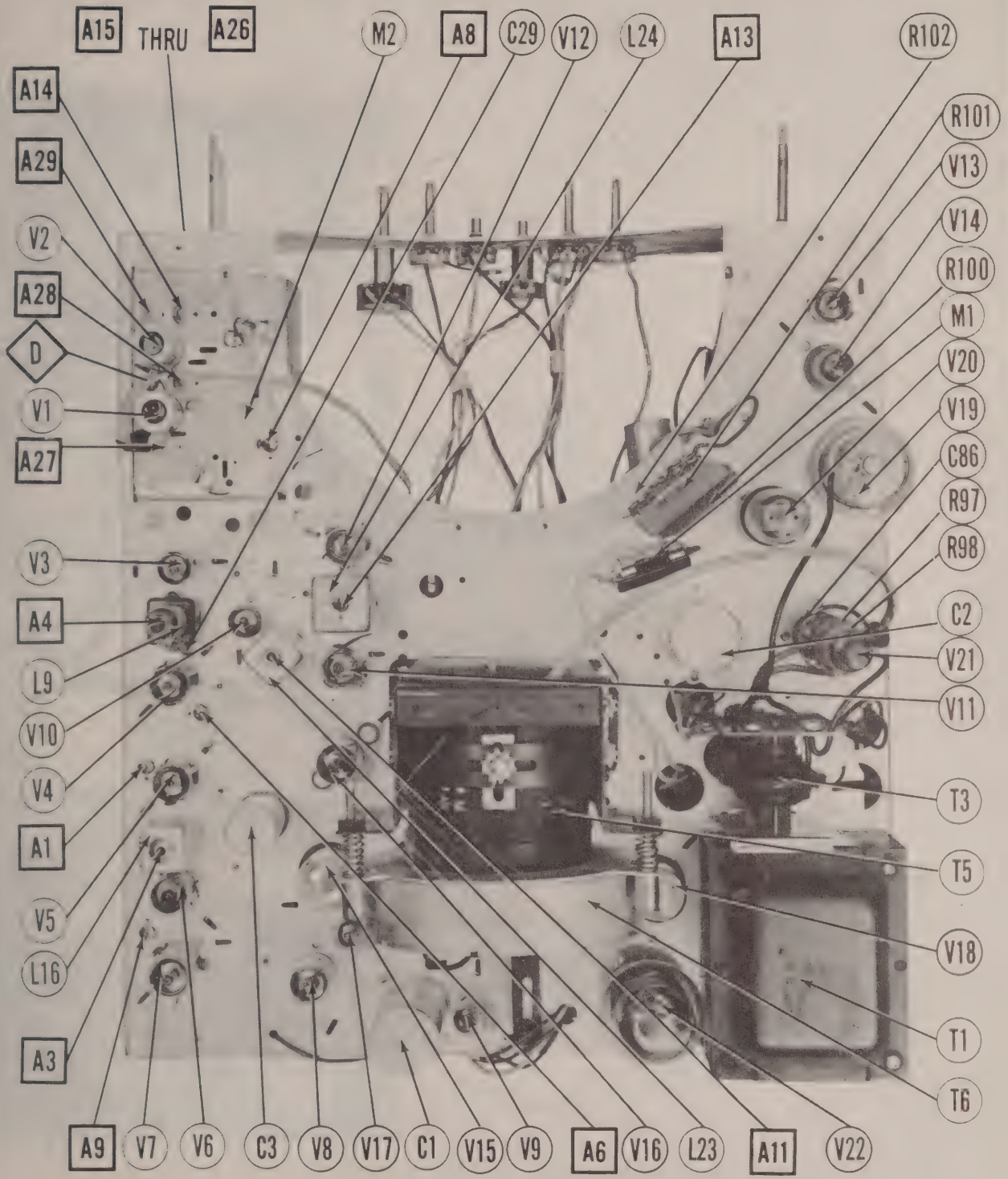
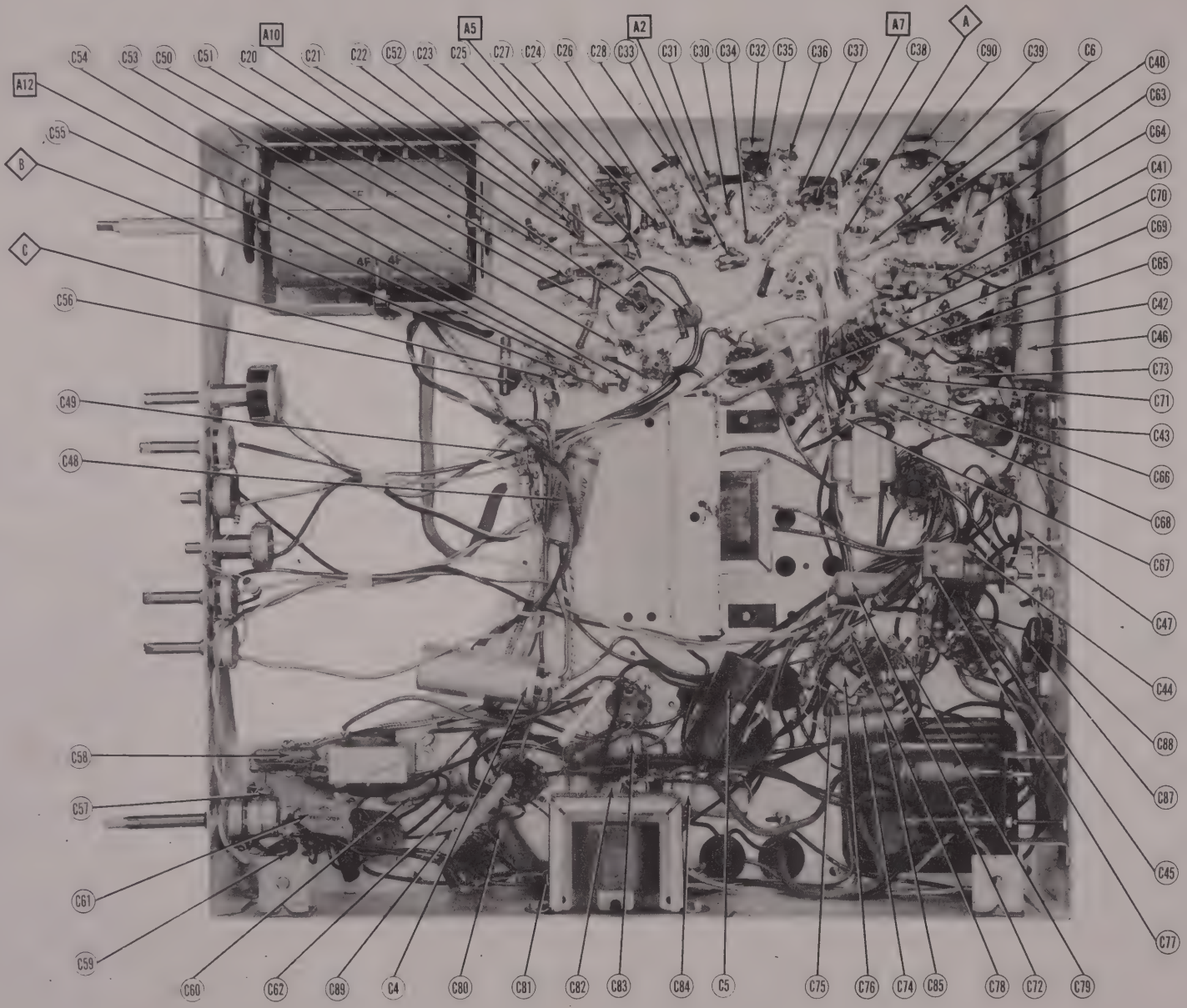
DATE 10-51 SET 148 FOLDER 2

AIRLINE MODELS 05WG-3030C, 05WG-3036A, B, 05WG-3039A, B

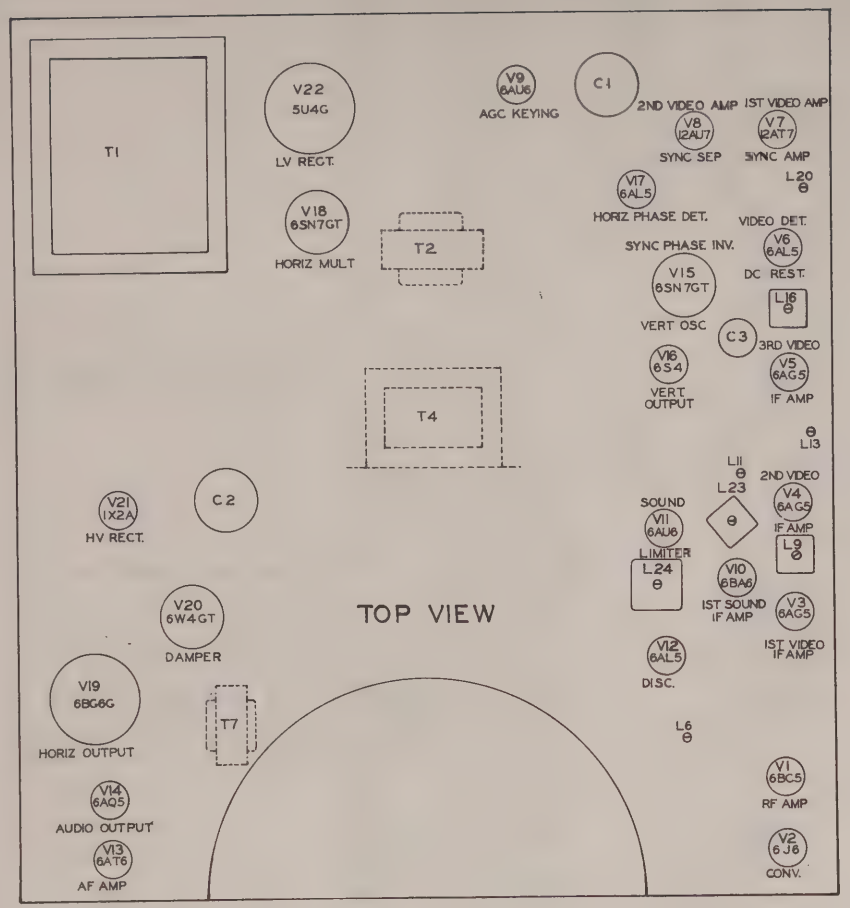

1ST SOUND IF AMP.
SOUND LIMITER
DISC.
AF AMP.
AUDIO OUTPUT
1ST VIDEO IF AMP.
2ND VIDEO IF AMP.
3RD VIDEO IF AMP.
VIDEO DET
1ST VIDEO AMP.
2ND VIDEO AMP.
DC REST.
AGC KEYING
SYNC AMP
SYNC SEP
SYNC PHASE INV
VERT. OSC.
VERT. OUTPUT
HORIZ PHASE DET
HORIZ MULT
HORIZ OUTPUT
HV RECT
DAMPER
FOCUS COIL
DEFLECTION YOKE
ION TRAP
16GP4
PICTURE TUBE
BRIGHTNESS CONTROL
CONTRAST CONTROL
HORIZ HOLD CONT
HORIZ FREQ
HORIZ SIZE
HORIZ LIN CONT
VERT HOLD CONT
VERT LIN CONT
HEIGHT CONT
VOL CONT
FOCUS CONT
FINE TUNING
ALTERNATE VERT OUTPUT CIRCUIT
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1951
AIRLINE MODELS 05WG-3030C, 05WG-3036A, B, 05WG-3039A, B

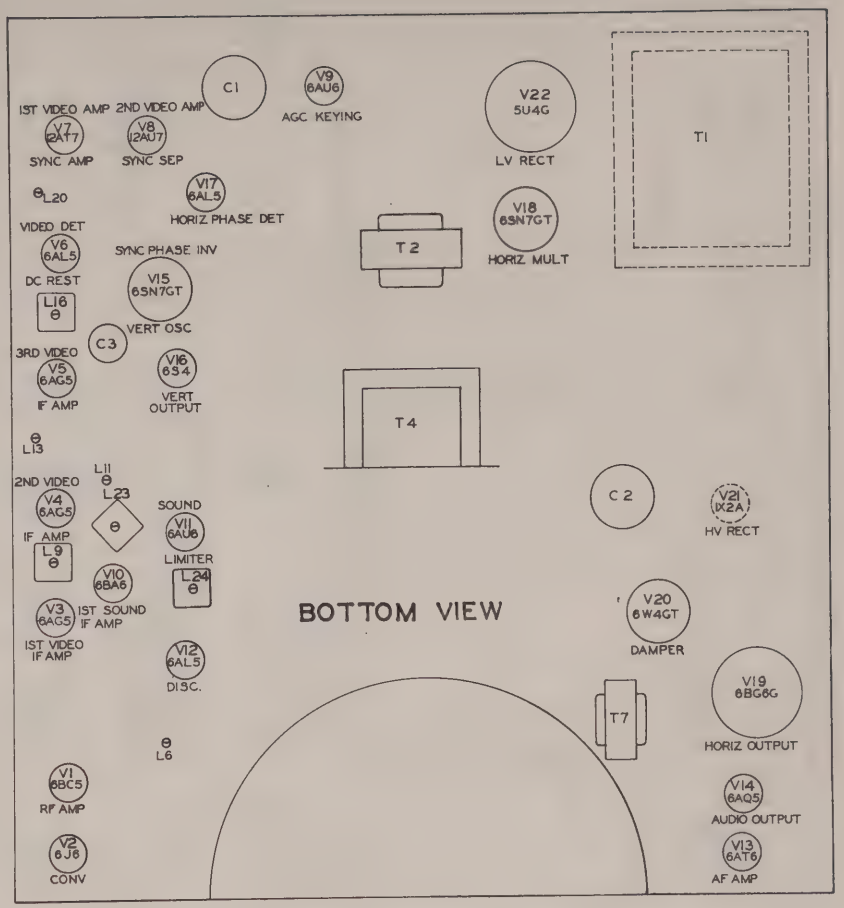


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

AIRLINE MODELS 05WG-3030C, 05WG-3036A, B, 05WG-3039A, B

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube, (V2) and replace it with a 6J6 which has Pin 1 removed. This will disable the local oscillator and prevent the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	20.2MC (Unmod.)	Any	DC probe to Point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	27.7MC	"	"	A2	"
3.	"	"	21.7MC	"	"	A3, A4	"
4.	"	"	22.7MC	"	"	A5	Adjust for maximum deflection.
5.	"	"	25.7MC	"	"	A6	"
6.	"	"	23.7MC	"	"	A7	"
7.	"	"	25.5MC	"	"	A8	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative lead of a 3 volt battery to the ungrounded lead of C46, connect the positive lead to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	24MC (10MC SWP)	21.7MC 22.4MC 26.2MC	Any	Vert. amp. to Point (A). Low side to chassis.		Check for response curve similar to figure 1. If necessary retouch A5 thru A8 for proper response.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to Pin 2 (grid) of 12AT7, (V7). Low side to chassis.	Not used	4.5MC (400∿ Mod.)	Any	Vert. amp. to Pin 2 of picture tube. Low side to chassis.	A9	Adjust for MINIMUM 400∿ indication on scope.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	21.7MC (Unmod.)	Any	DC probe thru 1 meg to Point (B). Common to chassis.	A10, A11, A12	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to Point (C). Common to chassis.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	21.7MC (450KC SWP)	21.7MC	Any	Vert. amp. thru 22KΩ to Point (B). Low side to chassis.	A10, A11, A12	Adjust for maximum amplitude and symmetry as per figure 2.
11.	"	"	"	"	"	Vert. amp. to Point (C). Low side to chassis.	A13	Adjust A13 so 21.7MC occurs at center of cross over lines as per figure 3. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off-frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step, using A14. It should be noted that this is an all-channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A14 will not bring all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment for each channel that is off-frequency. The channel strip adjustment are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	215.75MC (Unmod.)	13	DC probe to Point (C). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
			209.75MC	12		A16	
			203.75MC	11		A17	
			197.75MC	10		A18	
			191.75MC	9		A19	
			185.75MC	8		A20	
			179.75MC	7		A21	
			87.75MC	6		A22	
			81.75MC	5		A23	
			71.75MC	4		A24	
			65.75MC	3		A25	
			59.75MC	2		A26	

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. amp. thru 10KΩ to Point ◇D◇. Low side to chassis.	A27, A28, A29	Adjust for response curve similar to figure 4 with markers above 90%.
13.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check all channels for response similar to figure 4. If markers fall below 70% on any channel make slight adjustments of A27, A28 and A29 with channel switch set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

FIG. 1

FIG. 2

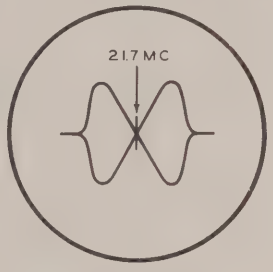


FIG. 3

FIG. 4

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	-.7VDC	0V	6.3VAC	0V	105VDC	105VDC	0V		
V 2	6J6	105VDC	70VDC	6.3VAC	0V	-2VDC	-§4.4VDC	0V		
V 3	6AG5	-.3VDC	.4VDC	0V	6.3VAC	115VDC	115VDC	.4VDC		
V 4	6AG5	-.2VDC	.2VDC	6.3VAC	0V	117VDC	117VDC	.2VDC		
V 5	6AG5	0V	1VDC	6.3VAC	0V	112VDC	112VDC	1VDC		
V 6	6AL5	0V	0V	6.3VAC	0V	1VDC	0V	-.4VDC		
V 7	12AT7	95VDC	-.4VDC	0V	6.3VAC	6.3VAC	260VDC	0V	6.3VAC	0V
V 8	12AU7	250VDC	0V	12VDC	6.3VAC	6.3VAC	5.8VDC	0V	2VDC	0V
V 9	6AU6	117VDC	130VDC	0V	6.3VAC	-.2VDC	265VDC	130VDC		
V 10	6BA6	0V	0V	0V	6.3VAC	112VDC	112VDC	1.6VDC		
V 11	6AU6	-.5VDC	0V	6.3VAC	0V	112VDC	85VDC	0V		
V 12	6AL5	-.1VDC	-.5VDC	6.3VAC	1.4VAC	0V	0V	-.5VDC		
V 13	6AT6	-.5VDC	0V	0V	6.3VAC	-1.7VDC	-1.7VDC	60VDC		
V 14	6AQ5	0V	13.5VDC	6.3VAC	0V	225VDC	240VDC	0V		
V 15	6SN7GT	-20VDC	140VDC 270VDC	0V	.6VDC	105VDC	16VDC	0V	6.3VAC	
V 16	6S4	0V	15VDC 40VDC	0V	0V	6.3VAC	0V	0V	0V	580VDC
V 17	6AL5	0V	0V	6.3VAC	0V	5.7VDC	0V	-3.6VDC		
V 18	6SN7GT	.4VDC	330VDC	12VDC	-4.7VDC	137VDC	12VDC	0V	6.3VAC	
V 19	6BG6G	-3.8VDC	6.3VAC	10VDC	0V	-3.8VDC	0V	0V	270VDC	*
V 20	6W4GT	0V	340VDC	600VDC	230VDC	380VDC	230VDC	380VDC	380VDC	
V 21	1X2A	* DO NOT MEASURE								
V 22	5U4G	0V	390VDC	0V	380VAC	0V	380VAC	125VDC	390VDC	
V 23	16GP4	0V	.4VDC	PIN 10 380VDC	PIN 11 125VDC	PIN 12 6.3VAC				

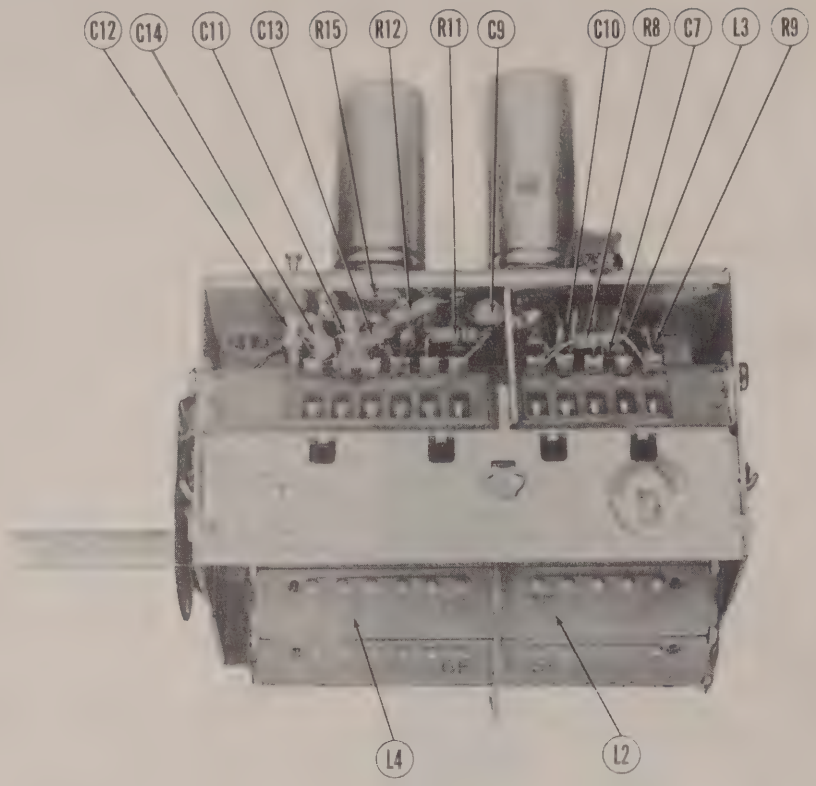
ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
* DO NOT MEASURE
§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

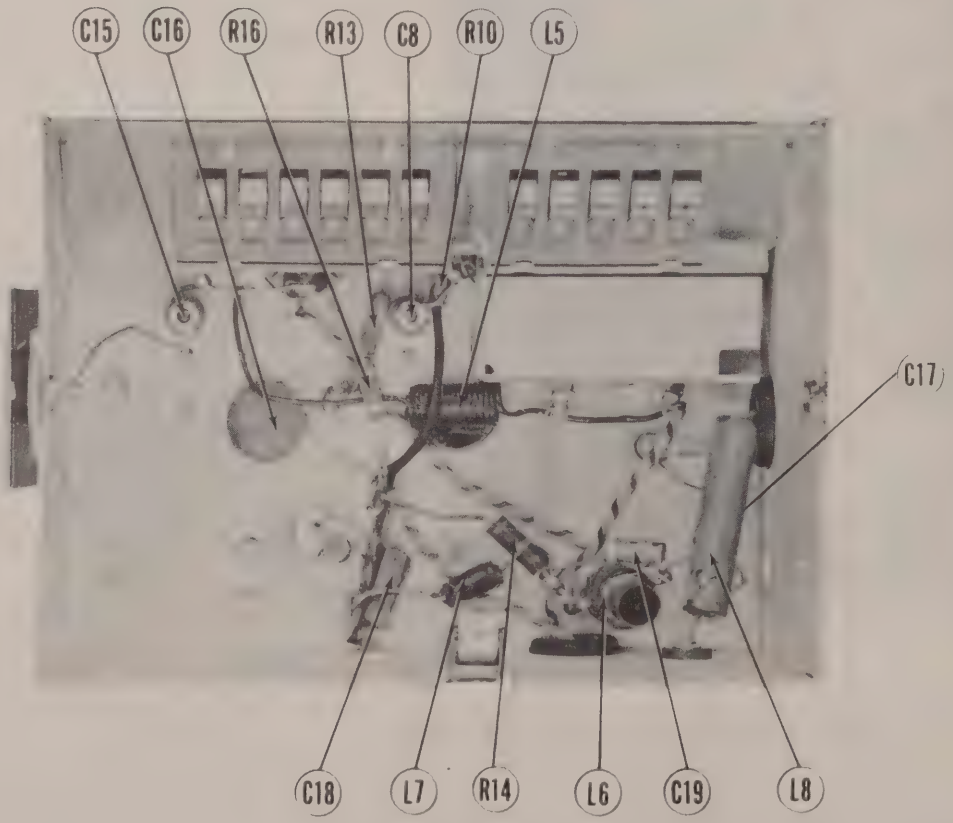
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	2Meg	0Ω	.1Ω	0Ω	†4.6KΩ	†4.6KΩ	0Ω		
V 2	6J6	†7.2KΩ	†20KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6AG5	900KΩ	50Ω	0Ω	.1Ω	†3.9KΩ	†3.9KΩ	50Ω		
V 4	6AG5	900KΩ	33Ω	.1Ω	0Ω	†3.6KΩ	†3.6KΩ	33Ω		
V 5	6AG5	12KΩ	150Ω	.1Ω	0Ω	†4.7KΩ	†4.7KΩ	150Ω		
V 6	6AL5	.1Ω	0Ω	.1Ω	0Ω	1Meg	0Ω	4.7KΩ		
V 7	12AT7	†11KΩ	4.7KΩ	.2Ω	.1Ω	.1Ω	†15KΩ	1Meg	20KΩ	0Ω
V 8	12AU7	†5KΩ	1Meg	3KΩ	.1Ω	.1Ω	†82KΩ	0Ω	50KΩ	0Ω
V 9	6AU6	†40KΩ	†2.4KΩ	0Ω	.1Ω	1.4Meg	†900Ω	†2.4KΩ		
V 10	6BA6	0Ω	0Ω	0Ω	.1Ω	†3.3KΩ	†3.3KΩ	100Ω		
V 11	6AU6	470KΩ	0Ω	.1Ω	0Ω	†3.3KΩ	†26KΩ	0Ω		
V 12	6AL5	200KΩ	100KΩ	.1Ω	2Ω	0Ω	0Ω	100KΩ		
V 13	6AT6	10Meg	0Ω	0Ω	.1Ω	Inf.	Inf.	†580KΩ		
V 14	6AQ5	470KΩ	400Ω	.1Ω	0Ω	†2.4KΩ	†1.8KΩ	470KΩ		
V 15	6SN7GT	3Meg	#3.2 Meg 1.2Meg	0Ω	1Meg	†7.2KΩ	3.3KΩ	0Ω	.1Ω	
V 16	6S4	Inf.	5.8KΩ 820Ω	2Meg	0Ω	.1Ω	2Meg	Inf.	Inf.	#8KΩ
V 17	6AL5	27KΩ	27KΩ	.1Ω	0Ω	4.7Meg	Inf.	4.7Meg		
V 18	6SN7GT	5Meg	†5.2KΩ	1.2KΩ	150KΩ	†270KΩ	1.2KΩ	0Ω	.1Ω	
V 19	6BG6G	1Meg	.1Ω	150Ω	Inf.	1Meg	Inf.	0Ω	†10KΩ	TOP CAP #90Ω
V 20	6W4GT	Inf.	12KΩ	550KΩ	12KΩ	†650Ω	12KΩ	†50Ω	†50Ω	
V 21	1X2A	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #540Ω
V 22	5U4G	Inf.	12KΩ	Inf.	22Ω	Inf.	21Ω	90KΩ	12KΩ	
V 23	16GP4	0Ω	1.3Meg	PIN 10 †50Ω	PIN 11 100KΩ	PIN 12 .1Ω				

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
† MEASURED FROM PIN 2 OF V22
# MEASURED FROM PIN 3 OF V20

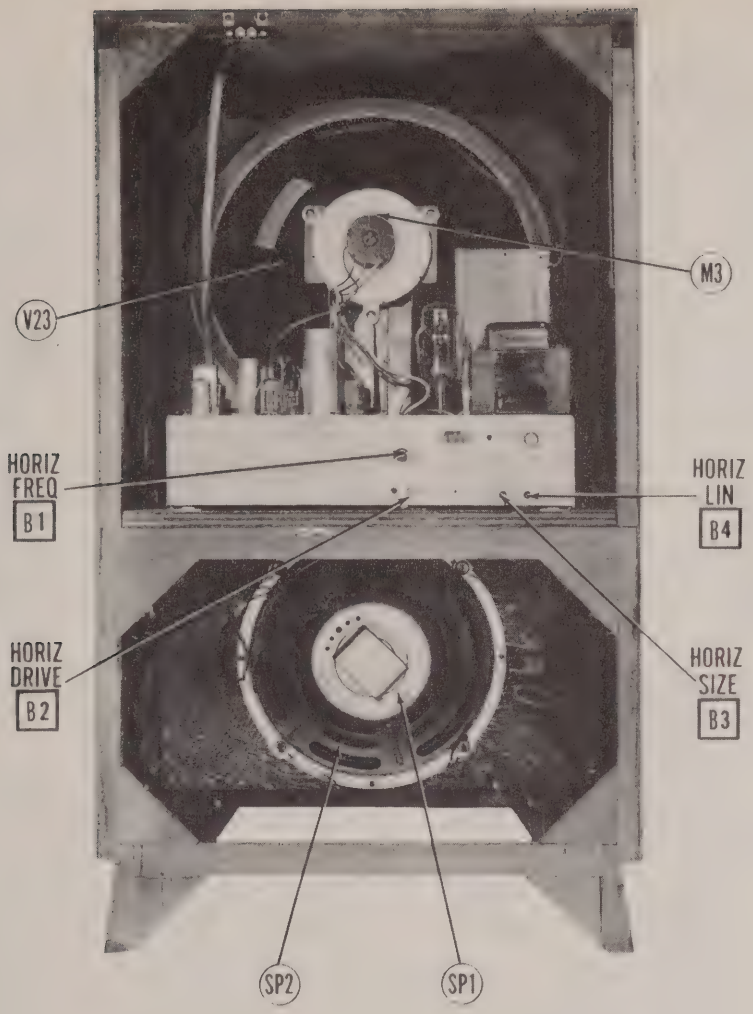
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET–REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer, (B2), counter-clockwise as far as possible without crowding or vertical lines appearing in the picture.

Adjust the horizontal size slug, (B3), until the picture fills the mask horizontally.

Adjust the horizontal linearity slug, (B4), until the picture is symmetrical from left to right. Slight readjustment of B2 may be necessary to obtain optimum linearity.

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove six wood screws from rear cover. Remove rear cover.
3. Disconnect built-in antenna.
4. Remove antenna terminal strip.
5. Disconnect speaker.
6. Remove four hex head bolts from chassis. Remove chassis.
7. Remove four hex nuts from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL, IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6BC5	6BC5	TBD	6AG5 or 6CB6 Alternates
V2	Converter	6J6	6J6	TBF	
V3	1st Video IF Amp.	6AG5	6AG5	7BD	
V4	2nd Video IF Amp.	6AG5	6AG5	7BD	
V5	3rd Video IF Amp.	6AG5	6AG5	7BD	
V6	Video Detector - 1st Video Amp. - Sync. Amplifier	6AL5	6AL5	6BT	
V7	2nd Video Amp. - Sync. Separator	12AT7	12AT7	9A	
V8	Sync. Phase Inv. - Vert. Oscillator	12AU7	12AU7	9A	
V9	AGC Keying	6SN7GT	6SN7GT	8BD	
V10	1st Sound IF Amp.	6AU6	6AU6	9AC	
V11	Sound Limiter	6BA6	6BA6	7BK	
V12	Sound Detector	6AU6	6AU6	7BK	
V13A	AF Amplifier	6AL5	6AL5	6BT	
B	AF Amplifier	6AT6	6AT6	7BT	
V14	Audio Output	6AV6	6AV6	7BT	
V15	Sync. Phase Inv. - Vert. Oscillator	6AQ5	6AQ5	7BZ	
V16A	Vertical Output	6SN7GT	6SN7GT	8BD	
B	Vertical Output	6S4	6S4	9AC	
V17	Horiz. Phase Det.	6AQ5	6AQ5	7BZ	
V18	Horiz. Mult.	6AL5	6AL5	6BT	
V19	Horiz. Output	6SN7GTA	6SN7GTA	8BD	
V20	Damper	6BG6G	6BG6G	6AM	
V21A	H. V. Rectifier	5W4GT	5W4GT	4CG	
B	H. V. Rectifier	1X2A	1X2A	7CB	
V22	L. V. Rectifier	1X2	1X2	7CB	
V23	Picture Tube	5U4G	5U4G	5T	
		16GP4	16GP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	80	450	45X376	AF166J		UP8445		TVL-2777	▲ Filter
B	30	450							▲ Filter
C2A	80	450	45X376	AF166J		UP8445		TVL-2777	▲ Filter
B	30	450							▲ Filter
V3A	10	450	45X375	AF22J8B		UPT1145V4		TVL-3749	■ Vert. Output Dec. ▲ Output Decoupling Vert. Output Cathode
B	10	450							■ Filter
C	40	50							▲ Output Cathode
C4A	30	450	45X380	AFH6J		UP2145V5		TVL-3751	▲ Output Cathode
B	40	50		PRS50/50					Fixed Trimmer
C5	20	400	45X382	PRS450/20		BR2045A		TVA-1709	Vert. Output Dec.
C6	5	25	45X378	PRS150/4		BBR5-35		TVA-1203	Sync. Amp. Cathode
C7	3-9								Variable Trimmer
C8	.5-3				829-3				Variable Trimmer
C9	120			SII20	D6-121		GP2K-121	19C29	RF Amp. Dec.
C10	1000			BPD-001	DD-102		8GI-001	19C1	RF Amp. Fil.
C11	100			SII00N750	TCN-100		N750L-101	29C16	RF Coupling
C12	.5-3				829-3				Variable Trimmer
C13	20			SI20NPO	TCZ-20		NPOK-200		Osc. Grid Cap
C14	10			SII0N750	TCN-10		N750K-100	19C4	Fixed Trimmer
C15	.5-3				829-3				Variable Trimmer
C16A	1000			BPD-2X001	DD-2-102		812-001	29C7	RF Bypass
B	1000								Conv. Filament
C17	10			SII0NPO	TCZ-10		NPOK-100	19C3	Fixed Trimmer
C18	72	500							Fixed Trimmer
C19	300			SI300	D6-301		GP2K-301	19C31	IF Coupling
C20	1000		47X519	SII000	D6-102	1WSD1	GP2L-103	19C1	AGC Filter
C21	1000		47X519	SII000	D6-102	1WSD1	GP2L-102	19C1	RF Bypass
C22	1000		47X519	SII000	D6-102	1WSD1	GP2L-102	19C1	1st V. IF Dec.
C23	1000		47X519	SII000	D6-102	1WSD1	GP2L-102	19C1	1st V. IF Fil.
C24	270	500	47X445	1468-00025	D6-271	5W5T25	GP2K-271	1FM-325	IF Coupling
C25	1000		47X519	SII000	D6-102	1WSD1	GP2L-102	19C1	AGC Filter
C26	1000		47X519	SII000	D6-102	1WSD1	GP2L-102	19C1	RF Bypass
C27	1000		47X519	SII000	D6-102	1WSD1	GP2L-102	19C1	2nd V. IF Dec.
C28	1000		47X519	SII000	D6-102	1WSD1	GP2L-102	19C1	2nd V. IF Fil.
C29	47				TCZ-47		NPO-330-470	29C14	Fixed Trimmer
C30	51				TCZ-51		NPO-330-510		Fixed Trimmer
C31	270	500	47X445	1468-00025	D6-271	5W5T25	GP2K-271	1FM-325	IF Coupling
C32	47	500		1469-00005	TCZ-47	5R5Q5	NPO-330-470	29C14	Fixed Trimmer
C33	1000		47X519	SII000	D6-102	1WSD1	GP2L-001	19C1	RF Bypass
C34	1000		47X519	SII000	D6-102	1WSD1	GP2L-001	19C1	3rd V. IF Dec.
C35	1000		47X519	SII000	D6-102	1WSD1	GP2L-102	19C1	3rd V. IF Fil.
C36	1000		47X519	SII000	D6-102	1WSD1	GP2L-102	19C1	3rd V. IF Cathode
C37	270	500	47X445	1468-00025	D6-271	5W5T25	GP2K-271	1FM-325	IF Coupling
C38	1000		47X519	SII000	D6-102	1W5D1	GP2L-102	19C1	V. Det. Fil.
C39	5		47X562	SI5NPO	TCZ-4.7	5W5V5	NPOK-5	MS-55	V. Diode Filter
C40	43		47X563		TCZ-43		NPOL-430		Peaking
C41	.05	400	D67503	P488-05	DF-503	PTE485		4TM-S5	Video Coupling
C42	.1	400	D65104	P688-1	DF-104	PTE6P1		6TM-P1	Video Coupling
C43	.05	400	D67503	P488-05	DF-503	PTE485		4TM-S5	Video Coupling
C44	.1	200	B65104	P288-1	DF-104	PTE4P1		2TM-P1	Picture Tube Cath.
C45	1000	1000	47X569	1464-HV-001					Horiz. Sweep Coupling
C46	.5	200	B65504	P288-5		GT2P5		2TM-P5	AGC Filter
C47	.1	200	B65104	P288-1	DF-104	PTE4P1		2TM-P1	AGC Filter
C48	.5	200	B65504	P288-5		GT2P5		2TM-P5	AGC Filter
C49	1000		47X519	SII000	D6-102	1WSD1	GP2L-102	19C1	AGC Filter
C50	1000		47X519	SII000	D6-102	1WSD1	GP2L-102	19C1	1st 8. IF Dec.
C51	1000		47X519	SII000	D6-102	1WSD1	GP2L-102	19C1	1st 8. IF Cathode
C52	5000		47X507	BPD-005	DD-502	1D5D5	811-005	29CJ	Limiter Grid Filter
C53	1000		47X519	SII000	D6-102	1W5D1	GP2L-102	19C1	Limiter Plate Dec.
C54	1000		47X519	SII000	D6-102	1W5D1	GP2L-102	19C1	Limiter Screen
C55	270	500	47X445	1468-00025	D6-271	5W5T25	GP2K-271	1FM-325	RF Bypass
C56	5000		47X507	BPD-005	DD-502	1D5D5	811-005	29CI	Discr. Filament
C57	.05	200	B65503	P288-05	DF-503	PTE485		2TM-S5	Audio Coupling
C58	.005	200	B65502	P688-005	D6-502	PTE6D5	811-005	8TM-D5	Tone Comp.
C59	.01	200	B65103	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C60	.05	400	D67503	P488-05	DF-503	PTE485		4TM-S5	AF Amp. Plate Dec.

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C61A	250		*76X5	SI250	*	5W5T25	GP2K-251	19C13	AF Amp. Plate Dec.
B	10000			BPD-01	PC-80	PTE48I	821-01	38C1	Audio Coupling
C	250			SI250		5W5T25	GP2K-251	19C13	Output Grid
C62	.005	600	F65502	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Output Plate
C63	.05	400	D67503	P488-05	DF-503	PTE485		4TM-S5	Sync. Coupling
C64	.1	400	D65104	P488-1	DF-104	PTE4P1		4TM-P1	Sync. Coupling
C65	.05	400	D67503	P488-05	DF-503	PTE455		4TM-S5	Sync. Coupling
C66A	2000		† 76X7	P688-002	†	PTE6D2	GP2-333-202	6TM-D2	Integrator Net
B	5000			P688-005	PC-100	PTE6D5	GP2-333-502	6TM-D5	Integrator Net
C	5000			P688-005		PTE6D5	GP2-333-502	6TM-D5	Integrator Net
C67	4700	500	47X543	1467-005	D6-472	1D5D5	GP2-333-472	1FM-25	Vert. Osc. Grid
C68	.05	600	F65503	P688-05	DF-503	PTE685		6TM-S5	Vert. Discharge
C69	.25	400	D65254	P488-25		GT4P25		4TM-P25	Vert. Sweep Coupling
C70	1000		47X519	SII000	D6-102	1W5D1	GP2L-102	19C1	Horiz. Sync. Coupling
C71	1000		47X519	SII000	D6-102	1W5D1	GP2L-102	19C1	Horiz. Sync. Coupling
C72	.05	600	F67503	P688-05	DF-503	PTE685		6TM-S5	Horiz. Feedback
C73	.01	200	B65103	P488-01	D6-103	PTE4S1	821-01	4TM-S1	AFC Filter
C74	.005	600	B65502	P688-005	D6-502	PTE6D5	811-005	6TM-D5	AFC Filter
C75	.05	200	B65503	P288-05	DF-503	PTE485		2TM-S5	AFC Filter
C76	330	500	47X570	1468-00035	D6-331	5W5T3	GP2K-331	1FM-335	Horiz. MV Feedback
C77	3900	500	47X572	1464-004		1DR5D4		MS-24	Fixed Trimmer
C78	270	500	47X445	SI270	D6-271		GP2K-271	19C31	Horiz. Discharge
C79	390	500	47X571	1468-0004	D6-391	5W5T4	GP2K-391	1FM-34	Horiz. Sweep Coupling
C80	.05	600	F67503	P688-05	DF-503	PTE685		6TM-S5	Horiz. Output Screen
C81	.25	200	B65254	P488-25		GT2P25		2TM-P25	Horiz. Output Cathode
C82	.03	400	D65303	P688-03		PTE683		6TM-S3	Damper Filter
C83	.1	400	D65104	P488-1		PTE4P1		4TM-P1	Damper Filter
C84	.25	200	B65254	P488-25		GT2P25		2TM-P25	Horiz. Sweep Coupling
C85	.1	200	D65104	P288-1	DF-104	PTE4P1		2TM-P1	Fixed Trimmer
C86	500	20000	47X560	HV20C	TV3-502				H. V. Filter
C87	.01	400	46X410	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Line Filter
C88	.01	400	46X410	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Line Filter
C89	1000		47X519	SII000	D6-102	1W5D1	GP2L-102	19C1	Horiz. Output Screen † Fixed Trimmer
C90	360		47X568						

* Items C61A, C61B, C61C, R58A and R58B are combined into one unit.
† Items C66A, C66B, C66C, R73A, †73B and R73C are combined into one unit.
‡ Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	3000Ω		78X4	Concentrikit			Contrast Control - Front
B	1Meg			B17-114 ♦♦	RTV-218	SSBT-503-S	Volume Control And SW - Tapped @ 200KΩ - Rear
				B13-137X ♦			
C	Shaft End			E-202 ♦			Attach Per Instructions in "Concentrikit"
R2A	50KΩ	½	40X292	Q11-123	AG-44-S	B-31	Horiz. Horizontal Hold Control
B	Shaft		Not req.	Not req.	KSS-3	Not req.	Attach to R2A Per Instructions
R3A	500KΩ	½	40X290	Q11-133	AG-58-S	B-59	Brightness Control
B	Shaft		Not req.	Not req.	KSS-3	Not req.	Attach to R3A Per Instructions
R4A	5000Ω	½	40X294	Q11-114	AG-19-S		Vertical Linearity Control
B	Shaft		Not req.	PQ ¶	RS-2		Attach to R4A Per Instructions
C	Bushing		Not req.	8-3 §	59-186		Attach to R4A Per Instructions
R5A	2.5Meg	½	40X293	Q11-239	AG-84-S	B-83 ¶	Height Control
B	Shaft		Not req.	RQ	FKS-1/4	Not req.	Attach to R5A Per Instructions
R6A	1.5Meg	½	40X291	Q11-138	AG-83-S	B-75	Vertical Hold Control
B	Shaft		Not req.	Not req.	KSS-3	Not req.	Attach to R6A Per Instructions
R7A	4000Ω	2	40X304		43-4000		Focus Control - Wire Wound
B	Bushing		Not req.		59-186		Attach to R7A Per Instructions

¶ Fashion shaft to duplicate original.
§ Cut bushing to correct length.
♦ Shunt the terminals which are used on this replacement with an 8200Ω resistor.
ø Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R8	3900Ω			BTS-3900	Antenna Coil Shunt
R9	47KΩ 20%			BTS-47K	AGC Network
R10	2200Ω 20%			BTS-2200	RF Amp. Decoupling
R11	10KΩ			BTS-10K	RF Coil Shunt
R12	4700Ω 20%			BTS-4700	Mixer Grid
R13	220KΩ 20%			BTS-220K	Mixer Grid
R14	15KΩ				Mixer Plate
R15	10KΩ			BTS-10K	Osc. Grid
R16	4700Ω			BTS-4700	Osc. Plate
R17	750Ω 20%			BTA-820	AGC Network - See Note 2
R18	10KΩ		B84103		1st. Video IF Amp. Grid
R19	47Ω 5%		B83470		1st. Video IF Amp. Cathode
R20	1000Ω 5%		B84102	BTS-1000-5%	1st. Video IF Amp. Decoupling
R21	150Ω		B84151	BTS-150	1st. Video IF Amp. Decoupling
R22	8200Ω 5%		B83822		2nd. Video IF Amp. Grid
R23	33Ω 5%		B83330		2nd. Video IF Amp. Cathode
R24	1000Ω 20%		B84102	BTS-1000	2nd. Video IF Amp. Decoupling
R25	330Ω		B84331	BTS-330	Decoupling - See Note 14
R26	12KΩ 5%		B83123		3rd. Video IF Amp. Grid
R27	150Ω		B84151	BTS-150	3rd. Video IF Amp. Cathode
R28	2200Ω		B84222	BTS-2200	3rd. Video IF Amp. Decoupling
R29	22KΩ		B84223	BTS-22K	Plate Choke Shunt
R30	4700Ω		B84472	BTS-4700	Video Det. Diode Load
R31	33KΩ		B84333	BTS-33K	AGC Keying Grid
R32	2700Ω 5%		C83272	BTA-2700-5%	Voltage Divider
R33	33KΩ		B84333	BTS-33K	AGC Network - See Note 3
R34	470KΩ		B84474	BTS-470K	AGC Network
R35	820KΩ		B84824	BTS-820K	AGC Network
R36	470KΩ 20%		B85474	BTS-470K	AGC Network
R37	750Ω			BTS-820	AGC Network - See Note 2
R38	6200Ω			BTA-5600	1st. Video Amp. Plate - See Note 4
R39	1Meg		B84105	BTS-1Meg	2nd. Video Amp. Grid
R40	100Ω		B84101	BTS-100	2nd. Video Amp. Cathode
R41	3900Ω 5%		C83392	BTA-3900-5%	2nd. Video Amp. Plate
R42	10KΩ		B84103	BTS-10K	Isolation

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	IDENTIFICATION CODES
R43	1Meg		B84105	BTS-1Meg	DC Restorer Diode Load
R44	100KΩ 20%		B85104	BTS-100K	Voltage Divider
R45	100KΩ		B84104	BTS-100K	Picture Tube Grid
R46	100KΩ 20%		B85104	BTS-100K	Picture Tube Cathode
R47	100Ω	1	C84101	BW-1-100	Sound IF Amp. Cathode - Wire Wound-See Note 5
R48	1000Ω		B84102	BTS-1000	Sound IF Amp. Decoupling
R49	470KΩ		B84474	BTS-470K	Limiter Grid
R50	22KΩ		B84223	BTS-22K	Limiter Screen
R51	1000Ω		B84102	BTS-1000	Limiter Plate Decoupling
R52	100KΩ		B84104	BTS-100K	Disc. Diode Load
R53	5.6Ω	1		BW-1-5.6	Disc. Diode Filament - Wire Wound - See Note 6
R54	100KΩ		B84104	BTS-100K	De-emphasis
R55	68KΩ		B84683	BTS-68K	Tone Compensation
R56	10Meg		B85106	BTS-10Meg	AF Amp. Grid - See Note 13
R57	47KΩ		B84473	BTS-47K	AF Amp. Plate Decoupling
R58A	500KΩ		76X5 *	BTS-470K	AF Amp. Plate
B	500KΩ			BTS-470K	Output Grid
R59	390Ω	2	D84391	BW-2-390	Output Cathode - Wire Wound
R60	1000 Ω	2	D84102	BTB-1000	Output Decoupling
R61	10KΩ	2	B84103	BTS-10K	Isolation
R62	1Meg		B84105	BTS-1Meg	Sync. Amp. Grid
R63	22KΩ 20%		B84223	BTS-22K	Sync. Amp. Cathode
R64	12KΩ 5%		B83123	BTS-12K-5%	Sync. Amp. Plate
R65	2200Ω		B84222	BTS-2200	Isolation
R66	47KΩ 5%		B83473	BTS-47K-5%	Sync. Sep. Cathode
R65	820KΩ		B84824	BTS-820K	Sync. Sep. Plate
R68	68KΩ		B84683	BTS-68K	Voltage Divider
R69	3300Ω 5%		B83332	BTS-3300-5%	Sync. Phase Inv. Cathode
R70	1600Ω 20%			BTS-1500	Sync. Phase Inv. Plate - See Note2
R71	3300Ω 5%		B83332	BTS-3300-5%	Sync. Phase Inv. Plate
R72	1Meg		B84105	BTS-1Meg	Voltage Divider
R73A	22KΩ		76X7 †	BTS-22K	Integrator
B	8200Ω			BTS-8200	Integrator
C	8200Ω			BTS-8200	Integrator
R74	1Meg		B84105	BTS-1Meg	Vert. Osc. Grid
R75	100KΩ		B84104	BTS-100K	Vert. Osc. Grid
R76	1.5Meg 20%		B85155	BTS-1.5Meg	Vert. Osc. Plate - See Note 7
R77	4700Ω		B84472	BTS-4700	Vert. Peaking
R78	1.8Meg		B84185	BTS-1.8Meg	Vert. Output Grid
R79	820Ω		B84821	BTS-820	Vert. Output Cathode
R80	470KΩ 20%		B85474	BTS-470K	Bleeder
R81	470KΩ		B84474	BTS-470K	Bleeder
R82	100KΩ		B84104	BTS-100K	Horiz. Phase Det. Diode Load
R83	100KΩ		B84104	BTS-100K	Horiz. Phase Det. Diode Load
R84	4.7Meg		B84475	BTS-4.7Meg	Horiz. Phase Det. Diode Load
R85	27KΩ		B84273	BTS-27K	Horiz. Phase Det. Diode Load
R86	470KΩ 20%		B85474	BTS-470K	Horiz. AFC Filter
R87	1200Ω		B84122	BTS-1200	Horiz. MV Cathode - See Note 8
R88	4700Ω		B84472	BTS-4700	Horiz. MV Plate
R89	100KΩ		B84104	BTS-100K	Horiz. MV Grid
R90	270KΩ		C84274	BTA-270K	Horiz. MV Plate
R91	100Ω 20%		C85101		Parasitic Suppressor - See Note 9
R92	1Meg		B84105	BTS-1Meg	Horiz. Output Grid
R93	150Ω		D84151	BW-2-150	Horiz. Output Cathode
R94	10KΩ		43X247	1 3/4A-10K	Horiz. Output Screen - Wire Wound
R95	4300Ω 20%				Horiz. Linearity Coil Shunt - See Note 10
R96	22KΩ 5%		D83223	BTB-22K-5%	Horiz. Feedback
R97	3.3Ω			BW-½-3.3	HV Rectifier Filament - Wire Wound - See Note 11
R98	1Meg 20%		C85105		HV Filter
R99	6800Ω		D85682	BTB-6800	Decoupling
R100	10KΩ		43X247	1 3/4A-10K	Voltage Divider - Wire Wound
R101	1500Ω		43X246	1 3/4A-1500	Filter - Wire Wound
R102	500Ω		43X245	1 3/4A-500	Filter - Wire Wound
R103	1000Ω		D84102	BTB-1000	Focus Coil Shunt - See Note 1
R104	500Ω		43X257	1 3/4A-500	Focus Coil Shunt - Wire Wound - See Note 12

* Items R58A, R58B, C61A, C61B, and C61C are combined into one unit.
† Items R73A, R73B, R73C, C66A, C66B, and C66C are combined into one unit.

Note 1 Not used in all models.
Note 2 Some models use 1000Ω Resistor in this application.
Note 3 Some models use 22KΩ Resistor in this application.
Note 4 Some models use 5600Ω Resistor in this application.
Note 5 Some models use 82Ω Resistor in this application.
Note 6 Some models use 5.1Ω Resistor in this application.
Note 7 Some models use 470KΩ Resistor in this application.
Note 8 Some models use 1500Ω Resistor in this application.
Note 9 Some models use 150Ω Resistor in this application.
Note 10 Some models use 4700Ω Resistor in this application.
Note 11 Some models use 1Ω Resistor in this application.
Note 12 Some models use 1000Ω 2 watt Resistor in this application.
Note 13 Some models use Series Resistors in this application to obtain desired value.
Note 14 Some models use Parallel Resistors in this application to obtain desired value.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	PM	3.2Ω	12A490	12J12	12A4A	
	CONE DIA.	V. C. DIA.				
SP2	11 7/8"	1"				

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC @ 1.9A	760VCT .240ADC	5VAC @ 3A	6.3VAC @ 1.2A SEC. 4 6.3VAC @ 7.8A	53X313 ① 53X308 ①	P8159 ②		TP-392

① Used in some models.
② Redrill mounting holes.

AIRLINE MODELS 05WG-3030C, 05WG-3036A, B, 05WG-3039A, B

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA AIR LINE PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	NOTES
T2	170Ω	900Ω	54X5	A-8122 ③	A-3000		Vert. Block Osc. Trans.
T3	485Ω Tap 61Ω	4.5Ω SEC. 2 9Ω Taps .4Ω and 6.5Ω SEC. 3 0Ω	53X315		HV0-6 ④		Horizontal Output Trans.
T4	1060Ω Tap 12.5Ω		51X149	A-8123 ③	A-3036 ③	TS0-1 ③	Vert. Output Trans.
T5A	13Ω		9A2149	DY-7	MDF-70		Horizontal Deflection Coil
B	48Ω						Vertical Deflection Coil
T6	650Ω		9A2147		MF-2		Focus Coil

③ Drill one new mounting hole.
④ Use MWC-1 For AGC Winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA AIR LINE PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
T7	5.5KΩ	3.2Ω	490Ω	.9Ω	51X150	A-3877	A-3019 ③	R0-9 ③	③ Drill one new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA AIR LINE PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
L1	.240A	52Ω	2 Henries	52X88	C-2326	C-2974 ③	TR-3300 ③	③ Drill one new mounting hole.

COILS (RF-IF)

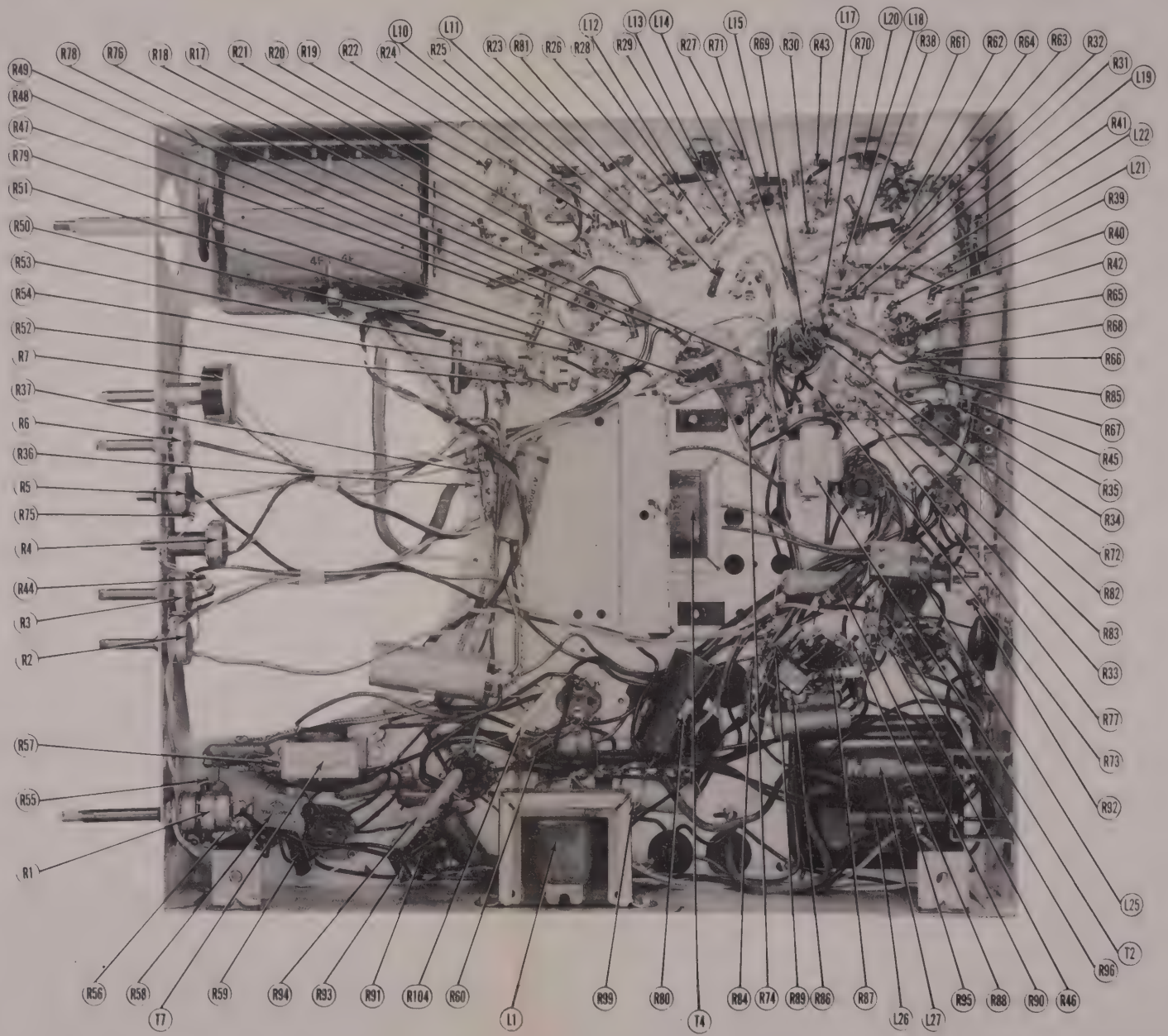
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA AIR LINE PART No.		NOTES
L2	Ant. Coils	0Ω	0Ω			
L3	Fil. Choke					
L4	RF, Mixer Grid, Osc. Coils	0Ω				
L5	Fil. Choke	0Ω				
L6	1st Video IF					
L7	RF Choke					
L8	IF Coupling Choke	1Ω	1Ω			
L9	2nd Video IF	.2Ω	0Ω	9A2076		
L10	Fil. Choke	0Ω		9A2033		
L11	3rd Video IF	.2Ω	0Ω	9A2055		
L12	Fil. Choke	0Ω		9A2033		
L13	Adj. Video Trap	.2Ω	.1Ω	9A2073		
L14	RF Choke	3Ω		9A1979		
L15	Fil. Choke	0Ω		9A2033		
L16	4th Video IF	.2Ω	.2Ω	9A2071		
L17	Peaking	1.2Meg		9A2090		390 Microhenries (Green Dot)
L18	Peaking	5Ω		9A2086		95 Microhenries (Wound on 4.7Ω resistor - yellow dot)
L19	Peaking	8Ω		9A2088		196 Microhenries (Blue Dot)
L20	4.5MC Trap	.4Ω		9A2074		
L21	Peaking	10Ω		9A2089		183 Microhenries (Wound on 2.2KΩ resistor - Red Dot)
L22	Peaking	6Ω		9A2087		125 Microhenries (White Dot)
L23	1st Sound IF	.2Ω	.2Ω	9A1986		
L24	Discr. Trans.	.1Ω	.1Ω	9A2049		
L25	Horiz. Osc.	53Ω		9A2096		
L26	Horiz. Lin.	25Ω		9A2111		
L27	Horiz. Size	.3Ω		9A1976		

FUSES

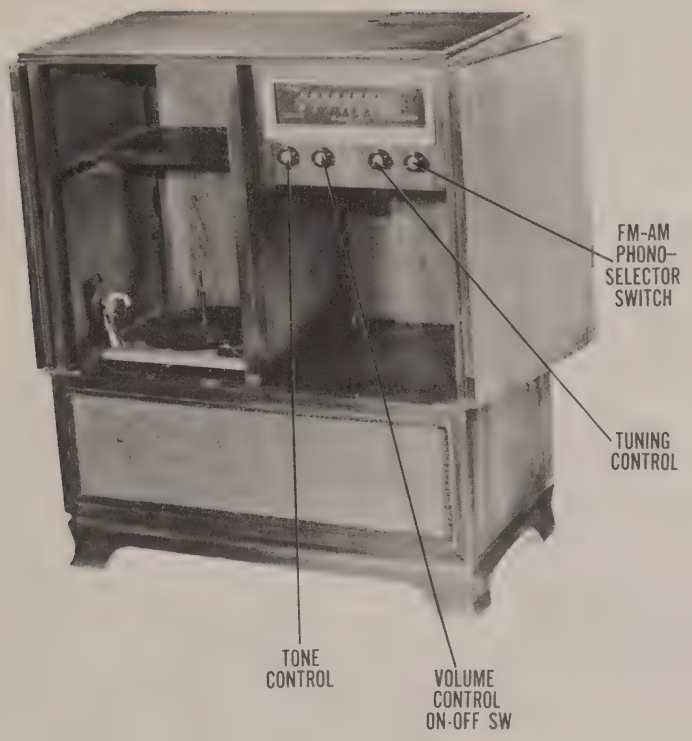
ITEM No.	TYPE	RATING	REPLACEMENT DATA AIR LINE PART No. FUSE	REPLACEMENT DATA AIR LINE PART No. HOLDER	REPLACEMENT DATA LITTELFUSE PART No. FUSE	REPLACEMENT DATA LITTELFUSE PART No. HOLDER	REMARKS
M1	4AG	.250A Slo-Blo	16X147		313.250	357001	

MISCELLANEOUS

ITEM No.	PART NAME	AIR LINE PART No.	NOTES
M2	RF Tuner	25A1071	
M3	Ion Trap	2A401	
B2	Trimmer	17A261	40-370MMF. (Horizontal Drive)
	Knob	10A741	Channel Selector } Models 05WG-3030C, 3039A, B
	Knob	10A742	Fine Tuning } Models 05WG-3030C, 3039A, B
	Knob	10A753	On/Off Volume } Models 05WG-3030C, 3039A, B
	Knob	10A752	Contrast
	Knob	10A769	Channel Selector } Model 05WG-3036A, B
	Knob	10A768	Fine Tuning } Model 05WG-3036A, B
	Knob	10A771	On/Off Volume } Model 05WG-3036A, B
	Knob	10A770	Contrast



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



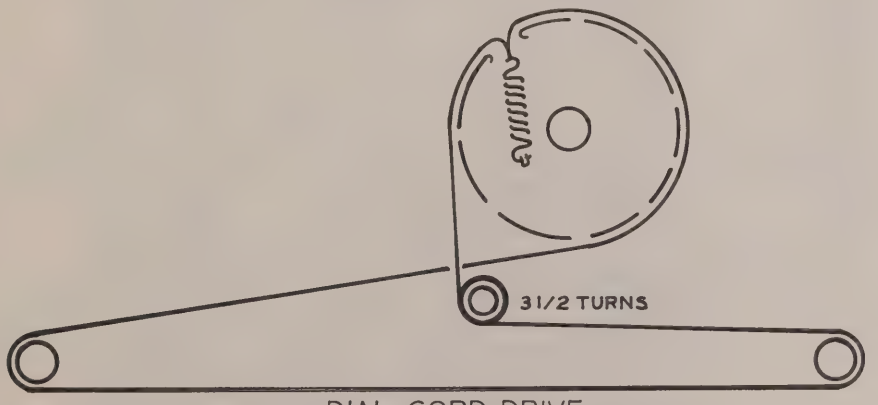
AIRLINE
MODELS 15BR-2756B, 15BR-2757A

AIRLINE
MODELS 15BR-2756B, 15BR-2757A

TRADE NAME	Airline, Models 15BR-2756B, 15BR-2757A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Illinois
TYPE SET	AC Operated Combination Phono-Radio, AM-FM Superheterodyne Receiver with Loop Antenna
TUBES (EIGHT)	Types 12AT7 FM RF Amp.-Mixer, 6BA7 AM Converter-FM Osc., 6BA6 1st IF Amp., 6AU6 2nd FM IF Amp., 6AL5 Ratio Det., 6AV6 AM Det.-AVC-AF, 6V6GT Power Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC
RATING	.52 Amp. @ 117 volts AC
TUNING RANGE--BROADCAST	540-1600KC
FREQ. MOD.	88-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER SEE MISCELLANEOUS MODEL 700F 33/45 IN PHOTOFACT SET 75 FOLDER 11 OR RECORD CHANGER MANUAL CM-3.

TUNING GANG FULLY CLOSED



DIAL CORD DRIVE

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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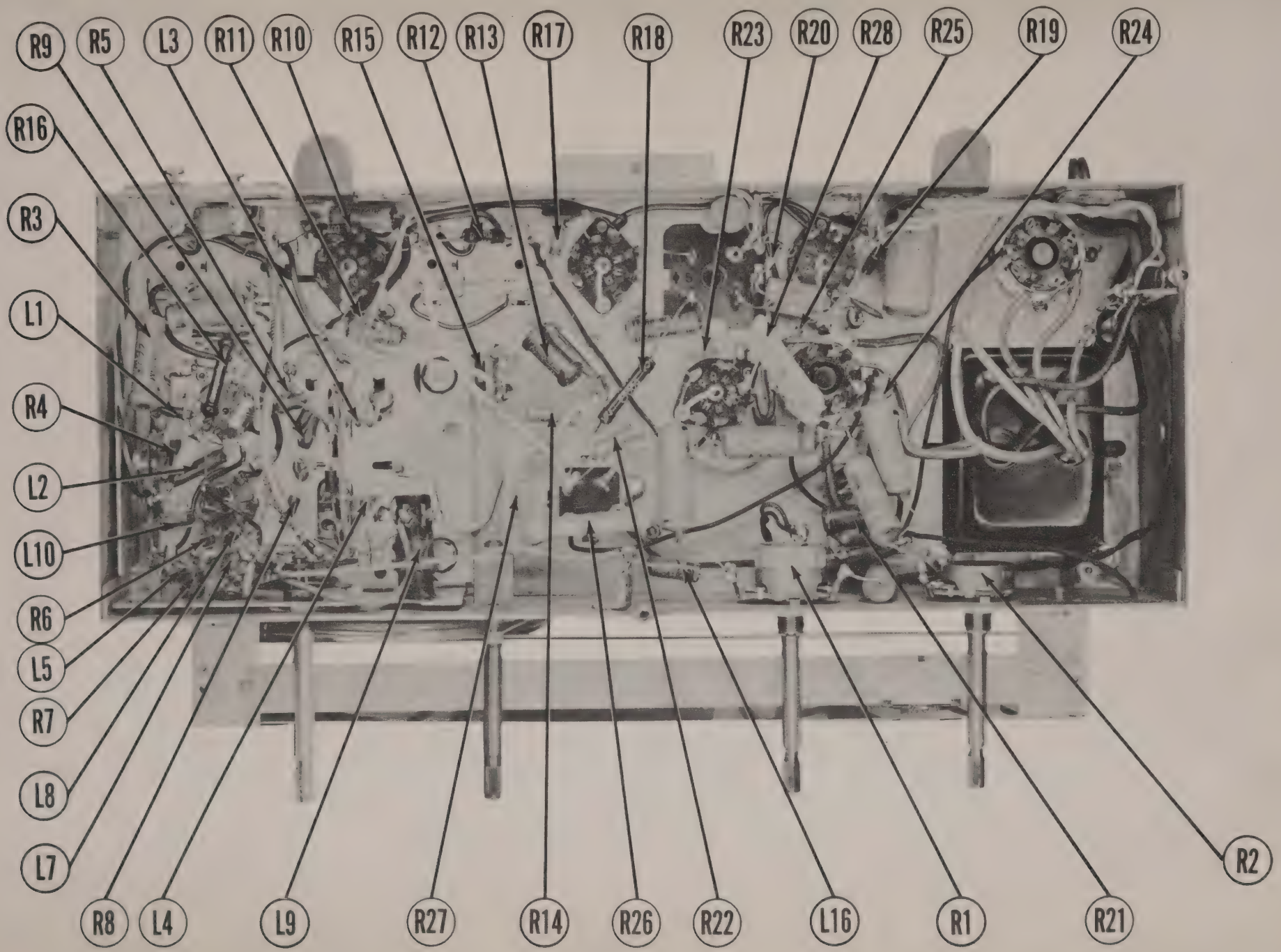
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L3
R11
R10
R15
R12
R13
R17
R18
R23
R20
R28
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R16
R3
L1
R4
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R6
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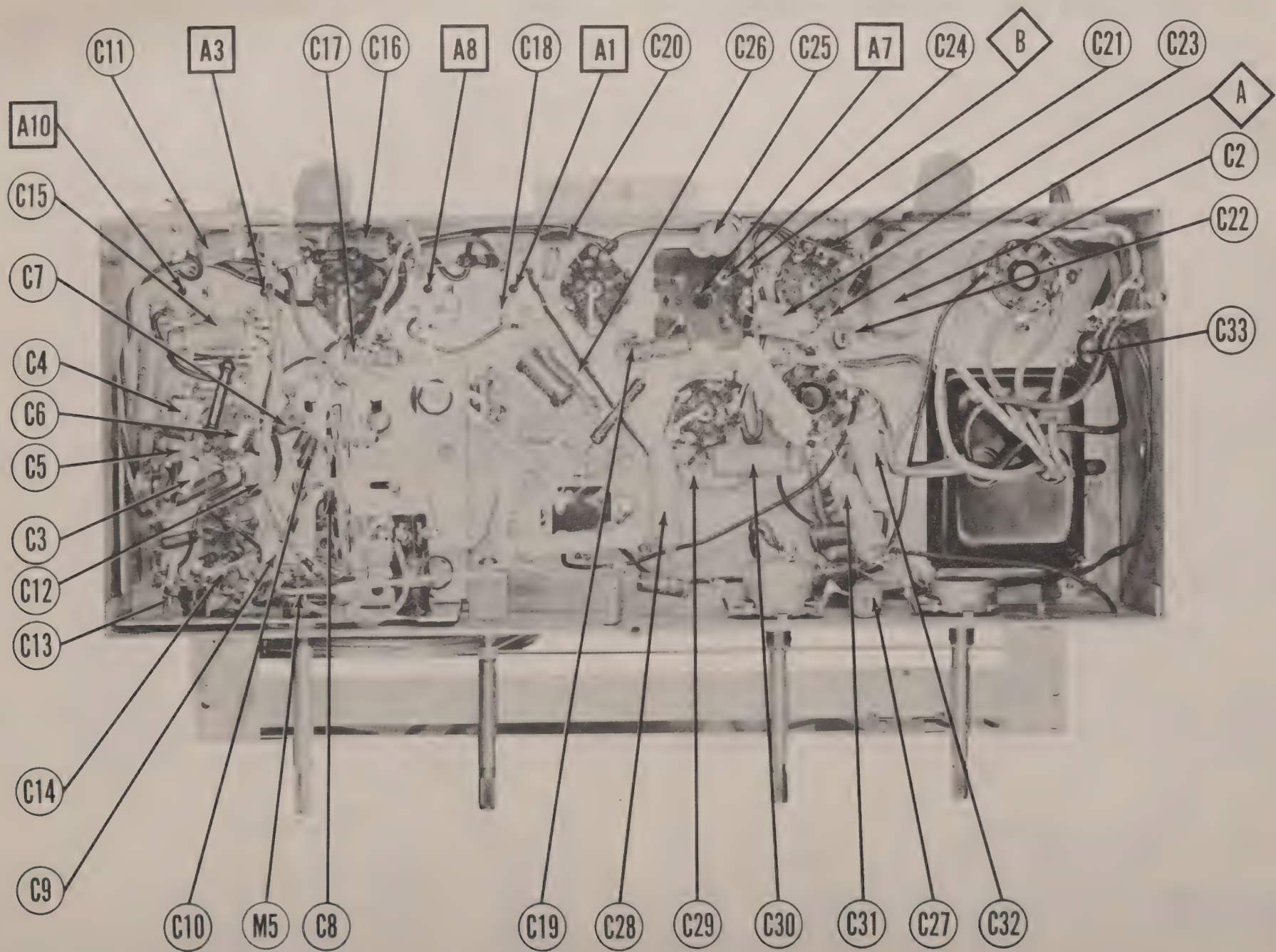
R2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A3
C17
C16
A8
C18
A1
C20
C26
C25
A7
C24
B
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C2
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C7
C33
C4
C6
C5
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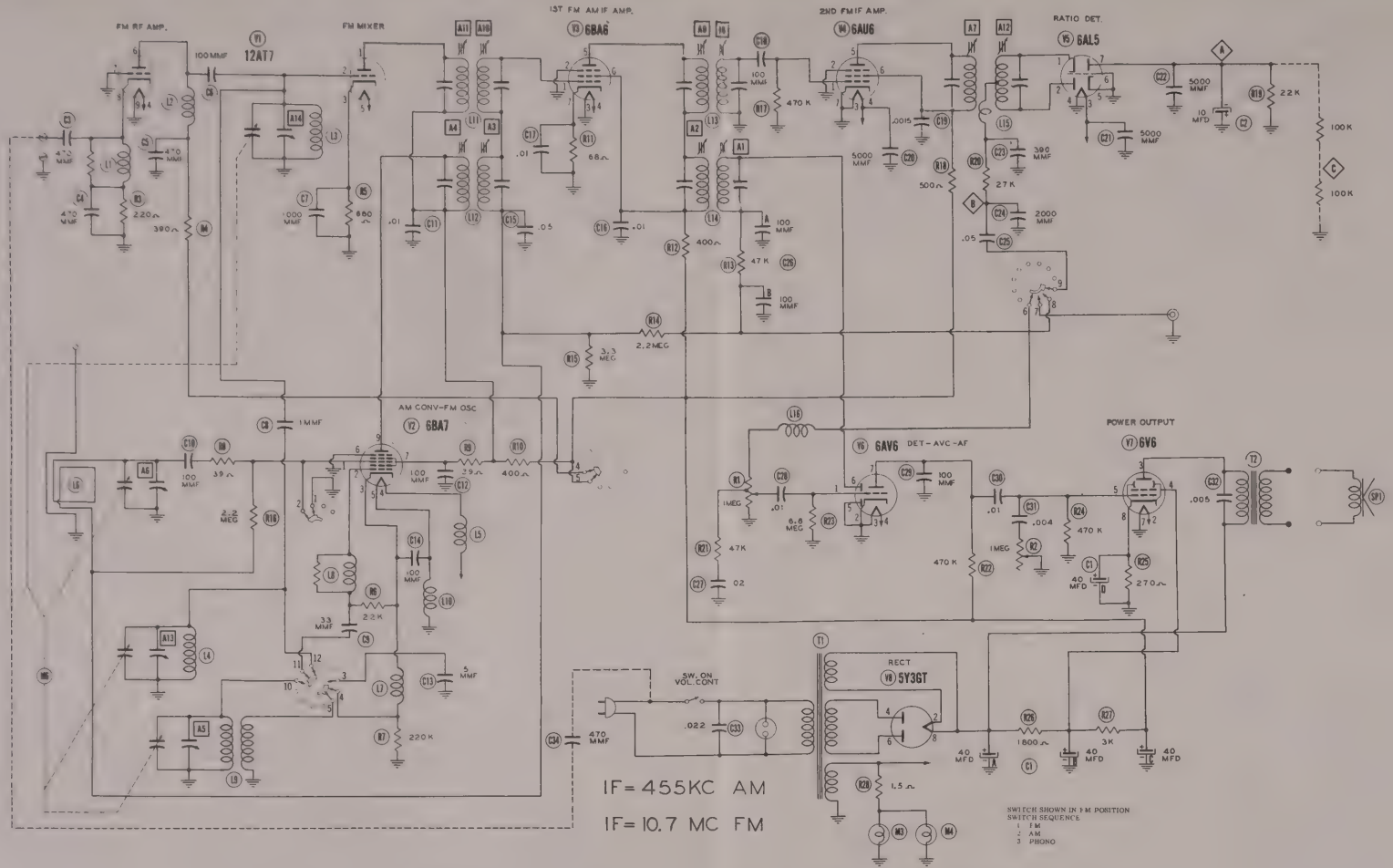
C30
C31
C27
C32



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AT7	75VDC	0V	1.1VDC	6.3VAC	6.3VAC	980VDC	0V	†.7VDC	0V
V 2	6BA7	80VDC	†-.3VDC ‡-3.9VDC	0V	6.3VAC	0V †80VDC	0V 980VDC	-.4VDC	0V	80VDC
V 3	6BA6	-.1VDC	0V	0V	6.3VAC	‡85VDC	985VDC	.8VDC		
V 4	6AU6	-.5VDC	0V	0V	6.3VAC	80VDC	80VDC	0V		
V 5	6AL5	-.4VDC	-.4VDC	6.3VAC	0V	0V	0V	-.6VDC		
V 6	6AV6	-.6VDC	0V	0V	6.3VAC	0V	†-.5VDC ‡-1.5VDC	50VDC		
V 7	6V6GT	0V	6.3VAC	230VDC	180VDC	0V	0V	0V	9.4VDC	
V 8	5Y3GT	0V	245VDC	0V	250VAC	0V	250VAC	0V	245VDC	

† TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AT7	†5.2KΩ	0Ω	680Ω	1Ω	1Ω	††5.2KΩ	0Ω	220Ω	0Ω
V 2	6BA7	†5.2KΩ ‡1.3Meg	22KΩ	‡1.1MΩ ‡.8Ω	3Ω	3Ω	0Ω	80Ω 3.3Meg	0Ω	†5.2KΩ
V 3	6BA6	1.7Meg	0Ω	0Ω	1Ω	†5.2KΩ	†5.2KΩ	68Ω		
V 4	6AU6	470KΩ	0Ω	0Ω	1Ω	†5.2KΩ	†5.2KΩ	0Ω		
V 5	6AL5	Inf.	Inf.	1Ω	0Ω	0Ω	Inf.	‡3.3Meg	22KΩ	
V 6	6AV6	6.8Meg	0Ω	0Ω	1Ω	0Ω	850KΩ	147KΩ		
V 7	6V6GT	Inf.	1Ω	†430Ω	†1.8KΩ	470KΩ	0Ω	0Ω	270Ω	
V 8	5Y3GT	Inf.	28KΩ	Inf.	325Ω	Inf.	120Ω	Inf.	28KΩ	

ALL MEASUREMENTS TAKEN IN AM POSITION UNLESS OTHERWISE NOTED.
‡ MEASURED IN FM POSITION
† MEASURED FROM PIN 8 OF V8.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning gang fully closed and set the left hand edge of the pointer carriage, even with the last two dots on the left top end of the pointer carriage slide.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BA7, (V2). Low side to chassis.	455KC (400 ∿Mod.)	AM (center)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1600KC	"	Set left hand edge of pointer carriage to last dots on right end of carriage slide	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	"	Tune for maximum output.	"	A6	"

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 1 (grid) of 6BA6, (V3). Low side to chassis.	10.7MC (Unmod.)	FM (CW)	Tuning gang fully closed.	DC probe to point Ⓐ. Common to chassis.	A7, A8, A9	Adjust for maximum deflection.
5.	"	High side to pin 2 (grid) of 12AT7, (V1). Low side to chassis.	"	"	"	"	A10, A11	"
6.	"	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
4.	.01MFD	High side to pin 1 (grid) of 6BA6, (V3). Low side to chassis.	10.7MC (450KC SWP)	FM (CW)	Point of noninterference.	Vert. amp. to point Ⓑ. Low side to chassis.	A7, A8, A9	Disconnect stabilizor capacitor C2. Adjust for maximum amplitude and symmetry as per fig. 1.
5.	"	High side to pin 2, (grid) of 12AT7, (V1). Low side to chassis.	"	"	"	"	A10, A11	"
6.	"	"	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A12	Reconnect capacitor C2. Adjust A12 so 10.7 MC occurs at center of crossover lines as per fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	300Ω carbon resistors	High side thru 300Ω to ungrounded FM ant. terminal. Low side to chassis.	108MC (Unmod.)	FM	Set left hand edge of pointer carriage to second dot, (front row) from right end of carriage slide.	DC probe to point Ⓐ. Common to chassis.	A13	Adjust for maximum deflection.
8.	"	"	98MC	"	Tune for maximum deflection.	"	A14	"

FIG. 1

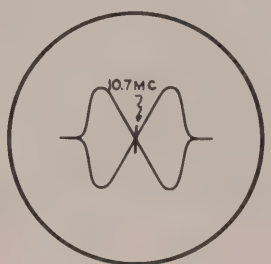


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1	FM RF Amp.-FM Mixer	12AT7	12AT7	9A	
V2	AM Conv. -FM Osc.	6BA7	6BA7	8CT	
V3	1st FM-AM IF Amp.	6BA6	6BA6	7BK	
V4	2nd FM IF Amp.	6AU6	6AU6	7BK	
V5	Ratio Detector	6AL5	6AL5	6BT	
V6	AM Det. -AVC-AF	6AU6	6AU6	7BK	
V7	Power Output	6V6GT	6V6GT	7AC	
V8	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

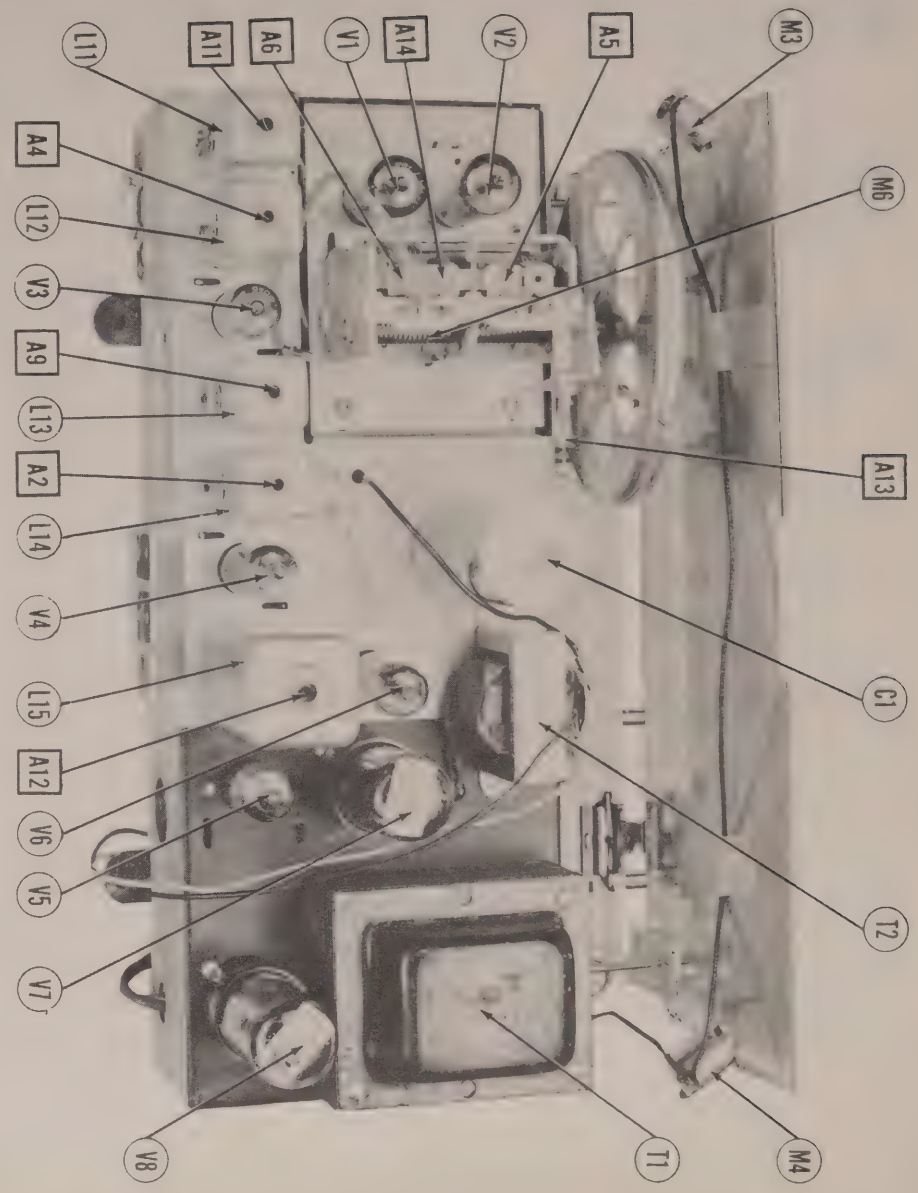
ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	350	A-8C-18125	AFH4-53		UPT4443		TVL-4739	▲ Filter
B	40	350				5C4			■ Filter
C	40	350							▲ Filter
C	40	25							Output Cathode
C2	10	50	A-8C-18128	PRS50/10		BR105		TVA-1304	Stabilizing Cap.
C3	470		C-8G-11732	SI470	D6-471	5W5T5	GP2K-471	5GA-T47	FM RF Coupling
C4	470		C-8G-11732	SI470	D6-471	5W5T5	GP2K-471	5GA-T47	FM RF Amp. Cathode
C5	470		C-8G-11732	SI470	D6-471	5W5T5	GP2K-471	5GA-T47	FM RF Amp. Dec.
C6	100		C-8G-12759	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	FM RF Coupling
C7	1000		C-8G-13201	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	FM Mixer Grid Filter
C8	1		A-8G-12495-1	1468-000001	TCZ-1		NPOK-010		FM Osc. Coupling
C9	33		C-8G-14172	SI33NPO	TCZ-33		NPOL-330	5TCC-Q33	Osc. Grid Cap.
C10	100		C-8G-13131	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	AM RF Coupling
C11	.01	400	C-8D-17270	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	AM Conv. Plate Dec.
C12	100		C-8G-12759	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	Osc. Anode
C13	5		C-8G-12166				N330-331-050		Fixed Trimmer
C14	100		C-8G-12759	SI100NPO	TCZ-100	5W5T1	NPO-333-101	5TCC-T1	Conv. Fil.
C15	.05	200	C-8D-10770	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C16	.01	400	C-8D-17270	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	1st IF Amp. Dec.
C17	.01	200	C-8D-11738	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	1st IF Amp. Cathode
C18	100		C-8G-11734	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	FM IF Coupling
C19	.0015	600	C-8D-19565	P688-0015	D6-152		GP2L-152	6TM-D15	2nd FM IF Amp. Dec.
C20	5000		A-8G-13962	BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd FM IF Amp. Fil.
C21	5000		A-8G-13962	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Ratio Det. Fil.
C22	5000		A-8G-13962	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass
C23	390	500	C-8F3-120	1468-0004	D6-391	5W5T4	GP2K-391	1FM-34	RF Bypass
C24	2000		C-8G-16049	SI2000	D6-202	1W5D2	GP2-333-202	5HK-D2	De-Emphasis
C25	.05	200	C-8D-10770	P288-05	DF-503	PTE4S5		2TM-S5	Audio Coupling
C26A	100		A-8F-13127	SI100	♦PC-50	5W5T1	GP1K-101	♦100C1	Diode RF Filter
B	100			SI100		5W5T1	GP1K-101		Diode RF Filter
C27	.02	200	C-8D-11304	P488-02	DF-203	PTE4S2		2TM-S2	Tone Comp.
C28	.01	200	C-8D-11738	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C29	100		C-8G-11734	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	AF Amp. Plate
C30	.01	400	C-8D-17270	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C31	.004	600	C-8D-10788	P688-005	D6-402	PTE6D4	GP2-333-402	6TM-D4	Tone Comp.
C32	.005	600	C-8D-10935	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Output Plate
C33	.02	600	C-8J-11321	P688-02	DF-203	PTE6S2		6TM-S2	Line Filter
C34	470		C-8G-11732	SI470	D6-471	5W5T5	GP2K-471	5GA-T47	FM Ant. Line Filter *

* Not used in all models.

♦ Replaces C26A, C26B, R13 in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg	½	A-10A-17971	Q18-137X	AT-103		Volume Control-Tapped @ 100KΩ
B	Shaft			Not Req.	KSS-3		Attach to R1A Per Instructions
C	Switch			76-1	SW-A		Attach to R1A Per Instructions
R2A	1Meg	½	A-11B-16502	Q13-137	AM-63-Z	BSK-70	Tone Control
B	Shaft			Not Req.	KSS-3	Not Req.	Attach to R2A Per Instructions



SET 148

FOLDER 3

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	AIRLINE PART No.	IRC PART No.	
R3	220Ω	½	C-9B1-54	BTS-220	FM-RF Amp. Cathode
R4	390Ω	½		BTS-390	FM-RF Amp. Plate See Note 1
R5	680Ω	½	C-9B1-60	BTS-680	Mixer Cathode
R6	22KΩ	½	C-9B1-78	BTS-22K	Osc. Grid
R7	220KΩ	½	C-9B1-27	BTS-220K	Osc. Grid
R8	39Ω	½			Parasitic Suppressor See Note 2
R9	39Ω	½			Osc. Anode See Note 2
R10	400Ω	½		BTS-390	AM Conv. Plate Dec. See Note 1
R11	68Ω	½	C-9B1-48		1st IF Amp. Cathode
R12	400Ω	½		BTS-390	1st IF Amp. Dec. See Note 1
R13	47KΩ	½	♦C-9B1-82	BTS-47K	Diode Filter
R14	2.2Meg	½	C-9B1-33	BTS-2.2Meg	AVC Network
R15	3.3Meg	½	C-9B1-34	BTS-3.3Meg	AVC Network
R16	2.2Meg	½	C-9B1-33	BTS-2.2Meg	AVC Network
R17	470KΩ	½	C-9B1-94	BTS-470K	2nd FM-IF Amp. Grid
R18	500Ω	½	C-9B1-58	BTS-470	2nd FM-IF Amp. Dec.
R19	22KΩ	½	C-9B1-78	BTS-22K	Ratio Det. Diode Load
R20	27KΩ	½	C-9B1-79	BTS-27K	De-Emphasis
R21	47KΩ	½	C-9B1-82	BTS-47K	Tone Comp.
R22	470KΩ	½	C-9B1-94	BTS-470K	AF Amp. Plate
R23	6.8Meg	½	C-9B1-36	BTS-6.8Meg	AF Amp. Grid
R24	470KΩ	½	C-9B1-94	BTS-470K	Output Grid
R25	270Ω	½	C-9B1-55	BTS-270	Output Cathode
R26	1800Ω	½	C-9C12-1102		Filter-Wire Wound
R27	3000Ω	½	C-9C12-2059		Filter-Wire Wound
R28	1.5Ω	½	C-9C2-1065	BW-1-1.5	Series Pilot Light-Wire Wound

♦ Items R13, C26A, and C26B are combined into one unit in some models.
Note 1 Some models use 470Ω in this application.
Note 2 Some models use 27Ω in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ②.52A	480VCT .056ADC	5VAC ②2A	6.3VAC ②2.25A	B-12A-18137	PM8404	P-3051 ①	PH-50 ①

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	5.5KΩ	3.2Ω	430Ω	.7Ω	B12C-18143-1	A-3877 ②	A-2930	RO-9 ②	② Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AIRLINE PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD RES.	V.C. IMP.		ST115		
SP1	PM	3.2Ω	B-18A-1872	Mod. P8-V	8A31	
	CONE DIA.	V.C. DIA.				
SP2	7½	9/16				

PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	AIRLINE PART No.	I.R.C. PART NO.	
L1	Para. Supp.	0Ω		A-16B-16616		Wound on Resistor
L2	RF Choke	1.7Ω		A-16B-16613		
L3	FM-RF Coil	0Ω		A-13E-16618		
L4	FM Osc. Coil	0Ω		A-13D-16617		
L5	Fil. Choke	.3Ω		A-16B-16023		
L6	AM Loop Ant.	2Ω		C-13E-18924-1		
L7	Cathode Choke	.3Ω		A-16B-16023		
L8	Para. Supp.	0Ω		A-16B-16615		Wound on Resistor
L9	AM Osc. Coil	.8Ω	5Ω	B-13D-18996		
L10	Fil. Choke	.3Ω		A-16B-16023		
L11	1st FM IF	.1Ω	1.4Ω	B-13A-18567		
L12	1st AM IF	14Ω	14Ω	B-13A-16662		
L13	2nd FM IF	1.3Ω	1.3Ω	B-13B-18568		
L14	2nd AM IF	14Ω	14Ω	B-13A-16662		
L15	Ratio Det. Trans.	2Ω	.1Ω	B-13M-19356		Tap .2Ω
L16	RF Choke	1.8Ω		A-16A-18676	CLA	2.2 Michrohenries

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	AIRLINE PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		AC-AG-J	A-AG	W26B	A66U	33	0-2 or S-2	

ASTATIC, SHURE, AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA		REMARKS
	AIRLINE PART No.	WALCO PART No.	
M2		W-30AGA	

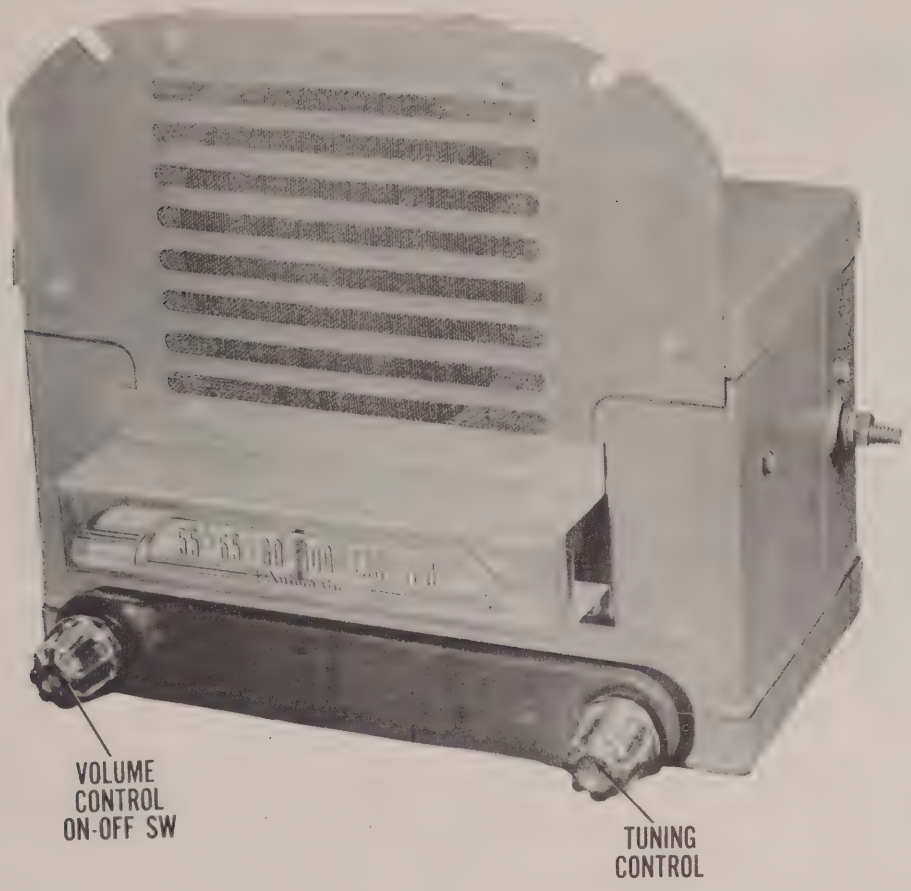
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AIRLINE PART No.		
M3	Bayonet	6-8	.25	Blue	A-46A-11971		Type number 44.
M4	Bayonet	6-8	.25	Blue	A-46A-11971		Type number 44.

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M5	Switch	B-20A-19475	FM-AM-Phono
M6	2 Gang Var. Cap.	B-8A-17673	(27-477MMF, 35-208MMF)
	Dial Scale	B-30A-18869	
	Knob	B-5B-18876-74	Plain
	Knob	B-5B-18877-74	With Indicator
	Dial Pointer	B-2G-18119	

AUTOMATIC
MODEL C-351



AUTOMATIC
MODEL C-351

TRADE NAME	Automatic, Model C-351
MANUFACTURER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston, Mass.
TYPE SET	Battery Operated Custom Built 1951 Chevrolet, Superheterodyne Receiver
TUBES (SIX)	Types 6BA6 RF Amp., 6BE6 Converter, 6BA6 IF Amp., 6AV6 or 6AT6 Det.-AVC-AF, 6AQ5 Power Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 6 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set the pointer mid-way between the fives of the 55 calibration. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6, (V2). Low side to chassis.	455KC (400 ∿Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	100MMF	High side to antenna socket. Low side to chassis.	1600KC	"	"	A5	"
3.	"	"	1400KC	Tune for maximum output.	"	A6, A7	"
4.	"	"	600KC	"	"	A8, A9	Adjust for maximum output. Repeat steps 3 and 4 until no further improvement can be made.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1951 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

AUTOMATIC
MODEL C-351

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		AUTOMATIC PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4A	Det. -AVC-AF	6AV6	6AV6	7BT	
B	Det. -AVC-AF	6AT6	6AT6	7BT	
V5	Power Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	AUTOMATIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	20	350	CE-86	AFH 3-107		UP2235C		TVL-3678	■ Filter
B	20	350							▲ Filter
C	20	25							Output Cathode
C2	.05	200	C207	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C3	.05	200	C207	P288-05	DF-503	PTE4S5		2TM-S5	RF Amp. Screen
C4	.05	200	C207	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C5	100		CC200	SI100NPO	TCZ-100		NPO-333-101	5TCC-T1	Osc. Grid Cap.
C6	220			SI220	D6-221	5W5T25	GP2K-221	5GA-T22	Diode RF Filter ‡
C7	.01	600	C206	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling †
C8	220			SI220	D6-221	5W5T25	GP2K-221	5GA-T22	AF Amp. Grid ‡
C9	220			SI220	D6-221	5W5T25	GP2K-221	5GA-T22	AF Amp. Plate ‡
C10	.01	600	C206	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C11	.01	600	C206	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Output Plate
C12	.008	1600	C205			PTE16D8		MB-D8	Buffer Cap.
C13	.5	100	C209	P185-5		GT2P5		68P20	Hash Filter
C14	.5	100	C209	P185-5		GT2P5		68P20	Hash Filter

† Some models use .002MFD in this application (Part No. C203)
‡ Some models use 200MMF in this application (Part No. CC201)

CONTROLS

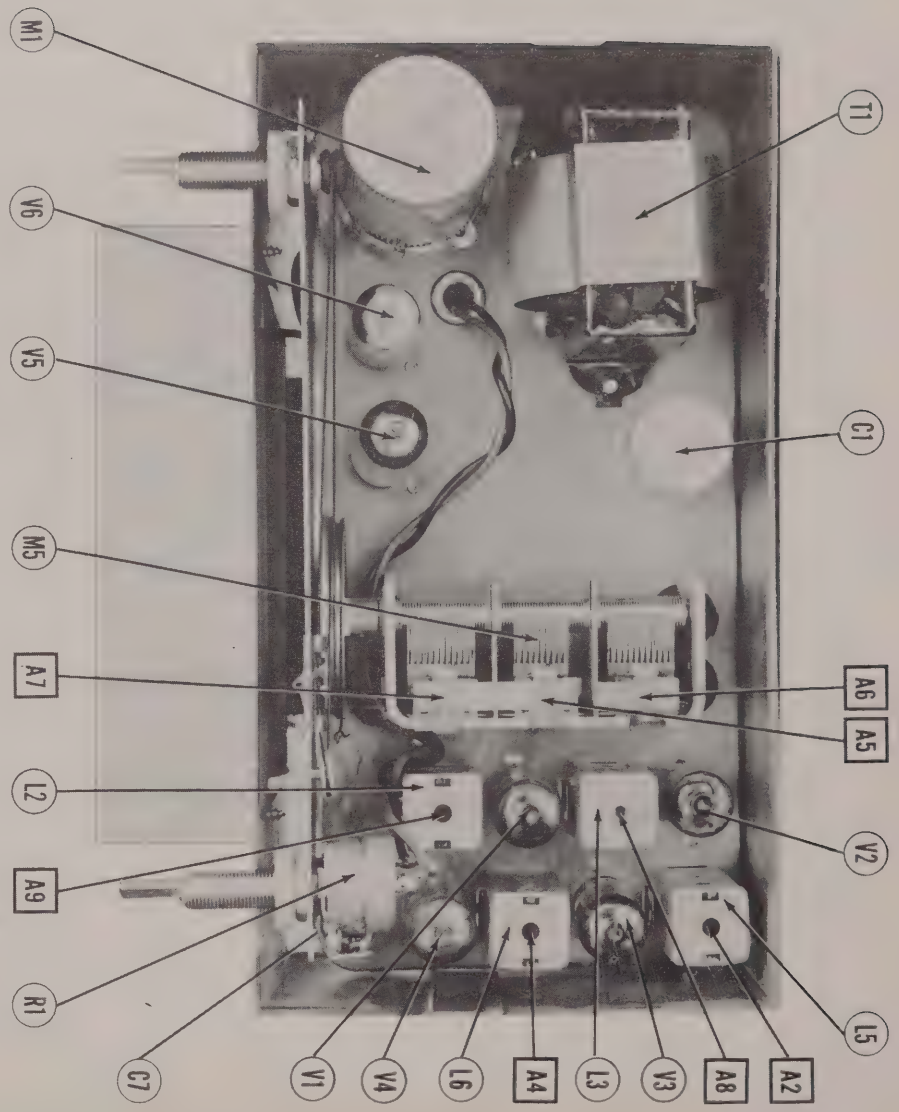
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	AUTOMATIC PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	750K	½	RV-200	Q13-137			Volume Control
B	Bushing		Not Req.	S-4			Attach to R1A
C	Switch		Not Req.	76-1			Attach to R1A Per Instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	AUTOMATIC PART No.	IRC PART No.	
R2	1Meg	½	R309	BTS-1Meg	AVC Network
R3	330Ω	½	R303	BTS-330	RF Amp. Cathode
R4	22KΩ	½	R306	BTS-22K	Osc. Grid-See Note 1
R5	1500Ω	½	R314	BTS-1500	IF Amp. Cathode
R6	22KΩ	2	R313	BTB-22K	Screen Dropping-See Note 1
R7	2.2Meg	½	R310	BTS-2.2Meg	AVC Network-See Note 2
R8	10Meg	½	R311	BTS-10Meg	AF Amp. Grid
R9	270KΩ	½	R307	BTS-270K	AF Amp. Plate-See Note 3
R10	680KΩ	½	R308	BTS-680K	Output Grid-See Note 4
R11	330Ω	½	R303	BTS-330	Output Cathode
R12	1000Ω	1	R312	BTA-1000	Filter
R13	68Ω	½	R301		Hash Suppressor-See Note 5
R14	68Ω	½	R301		Hash Suppressor-See Note 5

Note 1 Some models use 20KΩ resistor in this application.
Note 2 Some models use 2Meg resistor in this application.
Note 3 Some models use 250KΩ resistor in this application.
Note 4 Some models use 500KΩ resistor in this application.
Note 5 Some models use 100Ω resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	AUTOMATIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	6.3VDC @3.4A	530VCT .040ADC			TV-100 or TV-86A		P-2971	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AUTOMATIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	4KΩ	3Ω	380Ω	.5Ω	Part of PM-250	A-3877	A-2930	RO-9 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AUTOMATIC PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD RES.	V.C. IMP.				
SP1	PM	3Ω	PM250	ST108 Mod. P525-V	52A1	
	CONE DIA.	V.C. DIA.				
SP2	5"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	AUTOMATIC PART No.		
L1	Ant. Hash Choke	1.1Ω		L200		Wound on Capacitor
L2	Ant. Coil	14Ω	5Ω	57FB-3		
L3	RF Coil	100Ω	7.5Ω	57FB-4		
L4	Osc. Coil	9Ω	Tap .9Ω	L201		
L5	1st IF	19Ω	19Ω	1655-16		
L6	2nd IF	19Ω	19Ω	1655-16		
L7	Hash Choke	0Ω		L202		
L8	Hash Choke	0Ω		L203		

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA			INSTALLATION NOTES
				AUTOMATIC PART No.	CORNELL-DUBILIER PART No.	RADIART PART No.	
M1	INT	6.3V	115Ω	V-94	5301	5301	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			AUTOMATIC PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M2	3AG	15A	A201		311015	155020	

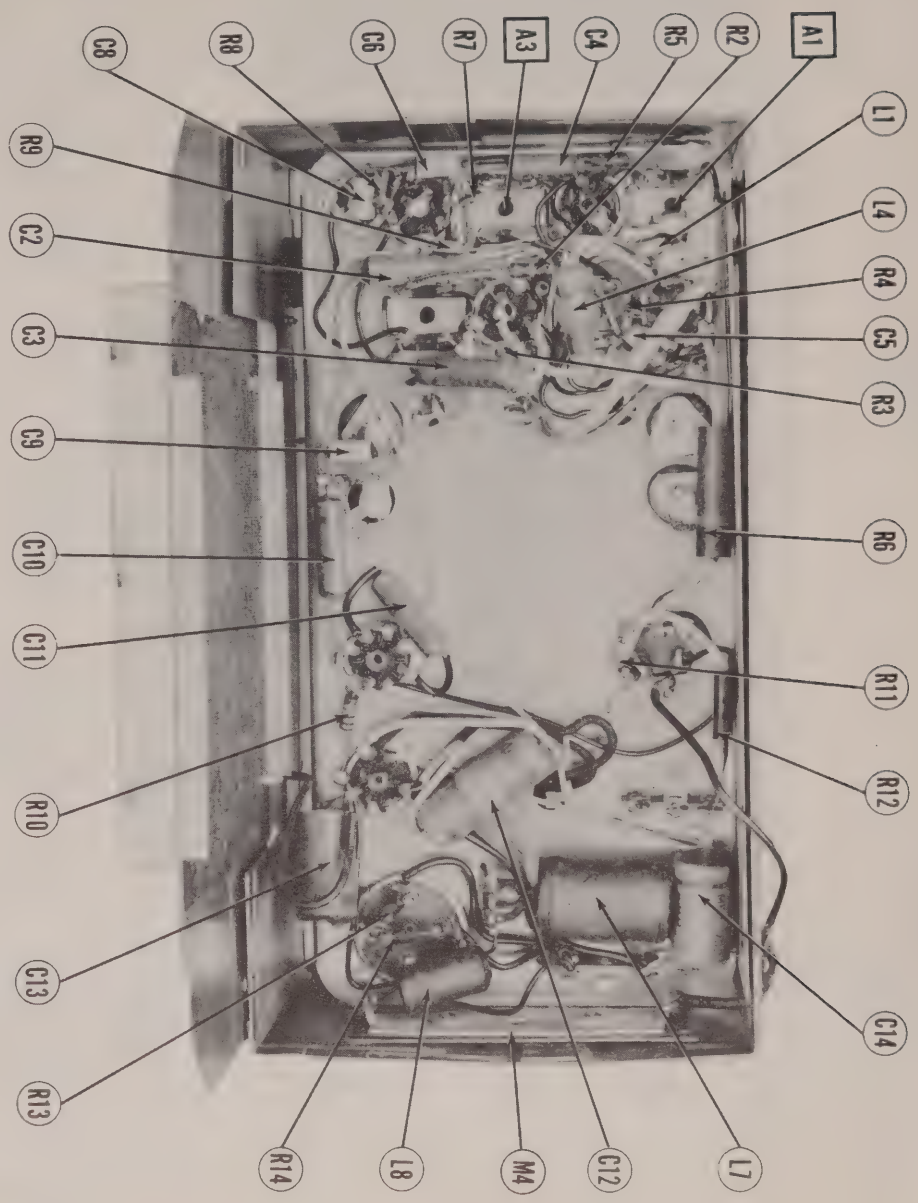
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AUTOMATIC PART No.		
M3	Bayonet	6-8	.15	Brown	T51		Type number 47.

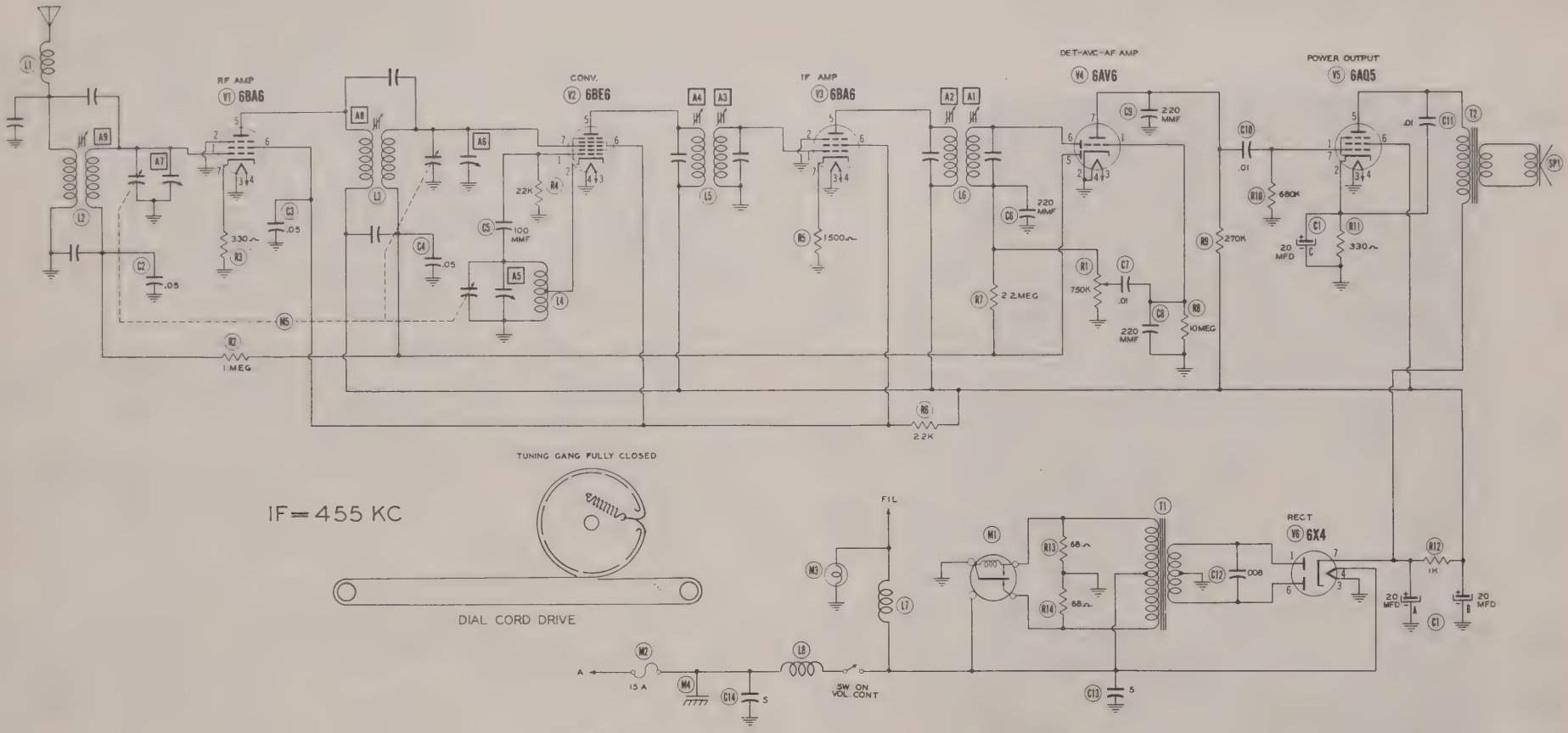
MISCELLANEOUS

ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
M4	Spark Plate		
M5	3 Gang Var. Cap.	CV-200	(24-387MMF, 20-317MMF, 37-227MMF)
	Knob	H310	
	Dial Scale	D351	
	Dial Pointer	PS351	

CHASSIS—BOTTOM VIEW



AUTOMATIC MODEL C-351



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	-.1VDC	0V	0V	6.3VDC	200VDC	75VDC	.9VDC
V 2	6BE6	1-6.7VDC	0V	6.3VDC	0V	200VDC	75VDC	-.5VDC
V 3	6BA6	7V	0V	0V	6.3VDC	200VDC	75VDC	2.2VDC
V 4	6AV6	-.6VDC	0V	6.3VDC	0V	-.5VDC	-.5VDC	80VDC
V 5	6AQ5	0V	11.4VDC	0V	6.3VDC	205VDC	205VDC	0V
V 6	6X4	250VAC	0V	0V	6.3VDC	0V	250VAC	215VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	3.7Meg	0Ω	0Ω	.4Ω	†1KΩ	†23KΩ	330
V 2	6BE6	22KΩ	.9Ω	.4Ω	0Ω	†1KΩ	†23KΩ	2.7Meg
V 3	6BA6	19Ω	0Ω	0Ω	.4Ω	†1KΩ	†23KΩ	1.5KΩ
V 4	6AV6	10Meg	0Ω	.4Ω	0Ω	2.7Meg	750KΩ	†270KΩ
V 5	6AQ5	680KΩ	330KΩ	0Ω	.4Ω	†380Ω	†1KΩ	680KΩ
V 6	6X4	250Ω	Inf.	0Ω	.4Ω	Inf.	270Ω	40KΩ

† MEASURED FROM PIN 7 OF V6.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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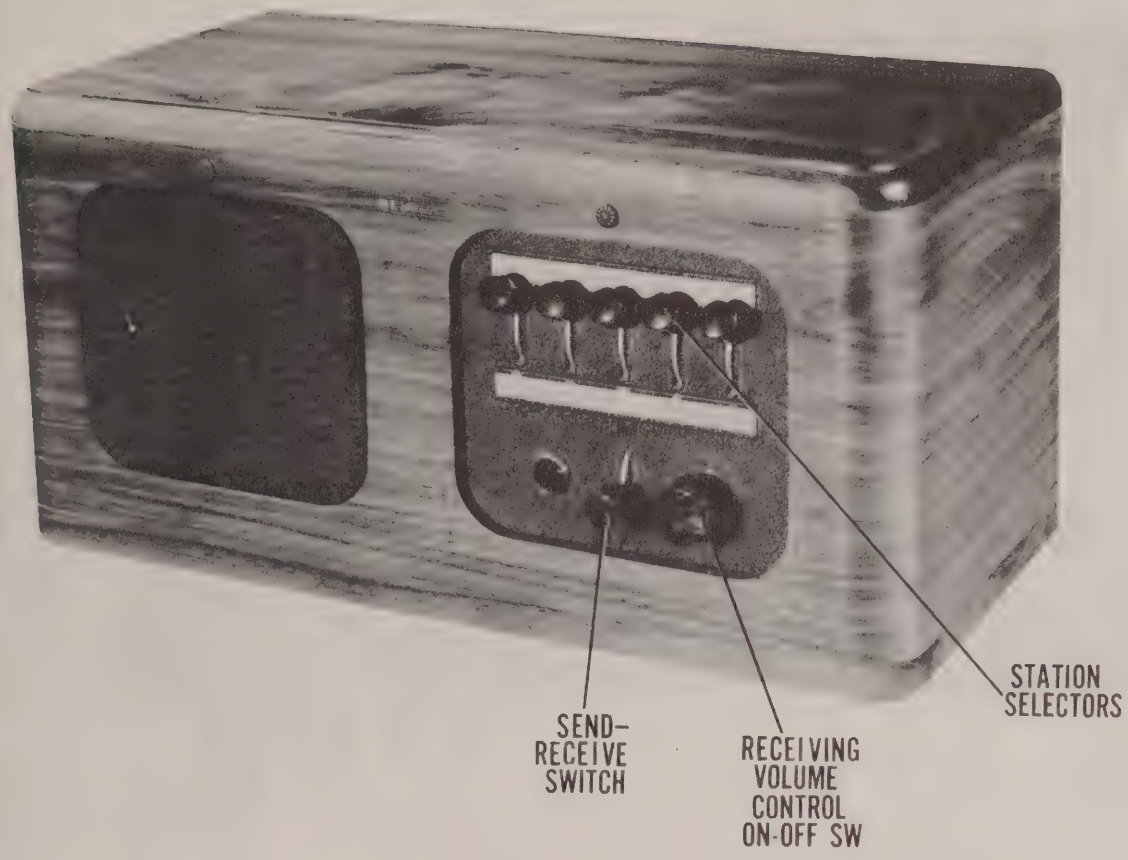
1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.



BELL SOUND
MODEL 350

BELL SOUND
MODEL 350

TRADE NAME	Bell Sound, Model 350 Belfone
MANUFACTURER	Bell Sound Systems, Inc., 1183 Essex Ave., Columbus, Ohio
TYPE SET	AC-DC Operated Inter Communications System
TUBES (THREE)	Types 7B7 AF Amp., 35A5 Power Output, 35Z3 Rectifier
POWER SUPPLY	110-120 Volts AC-DC RATING .22 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		BELL SOUND PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier	7B7	7B7	8V	
V2	Power Output	35A5	35A5	6AA	
V3	Rectifier	35Z3	35Z3	4Z	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	BELL SOUND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	30	250		AFH3-89		UP3325C		TVL-3513	■ Filter
B	30	250							▲ Filter
C	20	25							Output Cathode †
C2	10	25		PRS25/10		BR102A		TVA-1204	AF Amp. Cathode
C3	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	AF Amp. Screen
C4	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Audio Coupling
C5	.006	600		P688-006		PTE6D6	GP2-333-602	6TM-D6	Output Plate
C6	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Line Filter ‡

† Some models use 10MFD in this application.
‡ Some models use .1MFD in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	Bell Sound PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	10K	½		Q11-116	M-27-S	N-107	Volume Control Receiving
B	Switch			76-1	SWA	K-155	Attach to R1A Per Instructions
R2A	100K	½		Q13-128	AG-51-Z	N-117	Volume Control Master
B	Shaft			Not Req.	RS-3	Not Req.	Attach to R2A Per Instructions

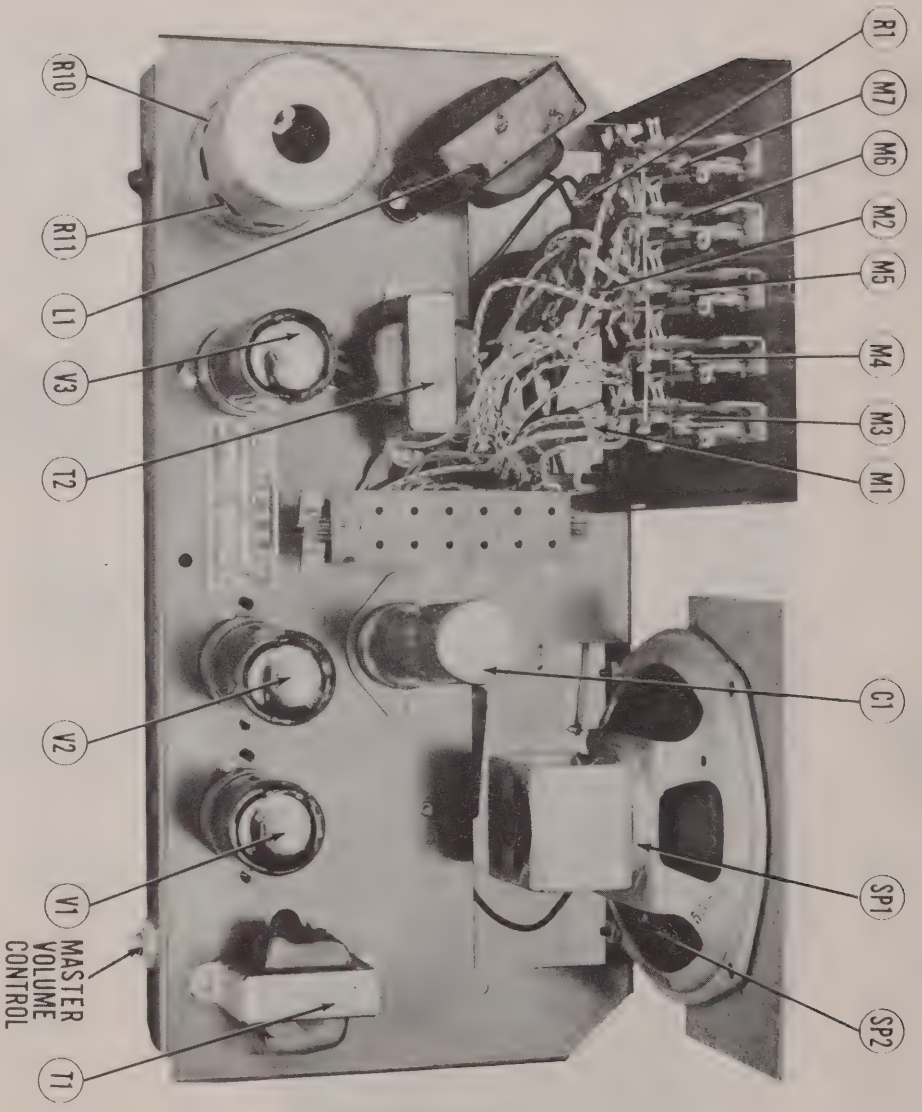
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	BELL SOUND PART No.	IRC PART No.	
R3	2500Ω	1		BTA-2700	AF Amp. Cathode
R4	100KΩ	2		BTB-100K	AF Amp. Screen
R5	250KΩ	½		BTS-270K	AF Amp. Plate
R6	10KΩ	½		BTS-10K	Voltage Divider
R7	1Meg	1		BTA-1Meg	Voltage Divider
R8	400KΩ	1		BTA-390K	Output Grid
R9	200Ω	1		BTA-220	Output Cathode
R10	250Ω	10		1 3/4A-250	Filament Dropping Wire Wound
R11	100Ω	10		1 3/4A-100	Pilot Light Shunt Wire Wound

TRANSFORMER (INPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		BELL SOUND PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1			5Ω	1.3KΩ	B-20072				

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		BELL SOUND	STANCOR	MERIT	CHICAGO	
	PRI.	SEC.	PRI.	SEC.	PART No.	PART No.	PART No.	PART No.	
T2	1.7KΩ	3.1Ω	160Ω	.6Ω	B-20073	A-3332 ①	A-2928	RO-2 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			BELL SOUND PART No.	JENSEN PART No.	QUAM PART No.	
SP1	FIELD RES.	V.C. IMP.		ST113 Mod. P4-X	4A1	
	PM	3.1Ω				
SP2	CONE DIA.	V.C. DIA.				
	4 ½	9/16				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	Bell Sound PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.060A	470Ω	13 Henries	B20058	C-1708 ①	C-2990		① Drill one new mounting hole.

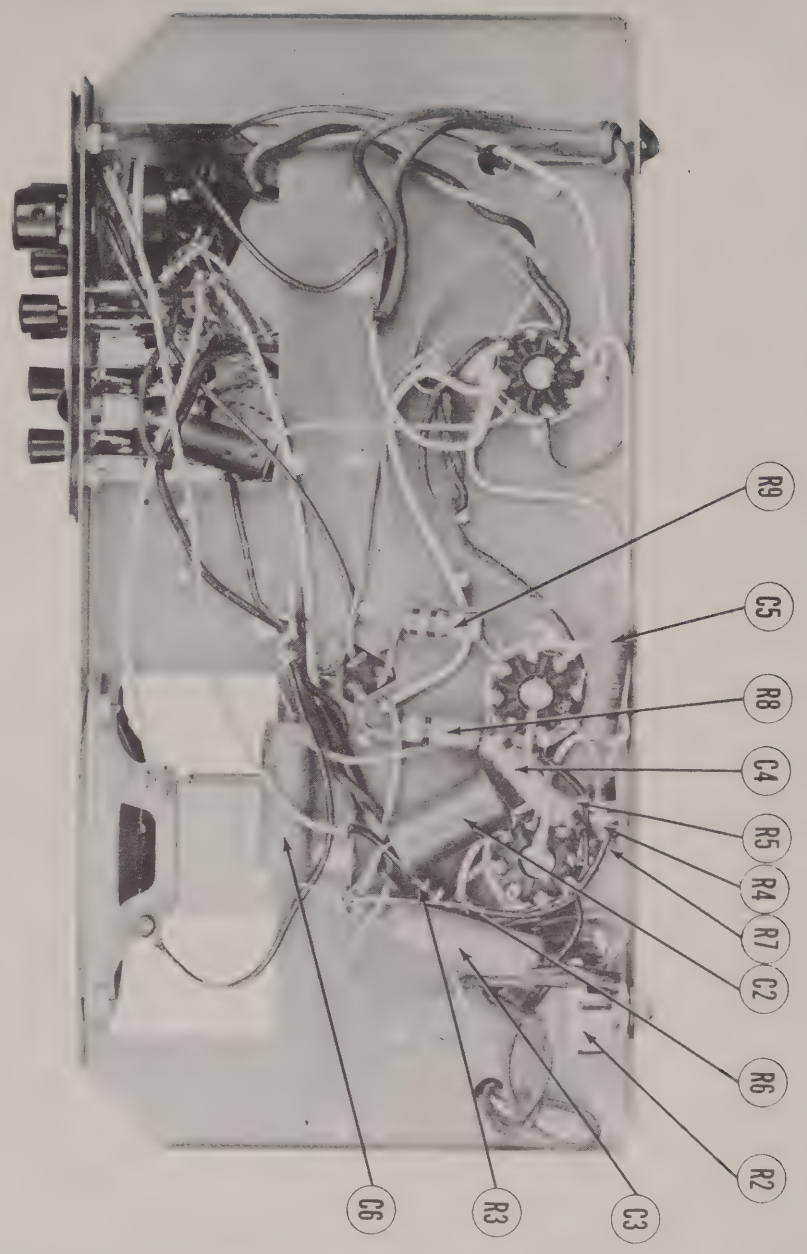
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					BELL SOUND PART No.		
M1	Bayonet	6-8	.25	Brown			Type number 44.

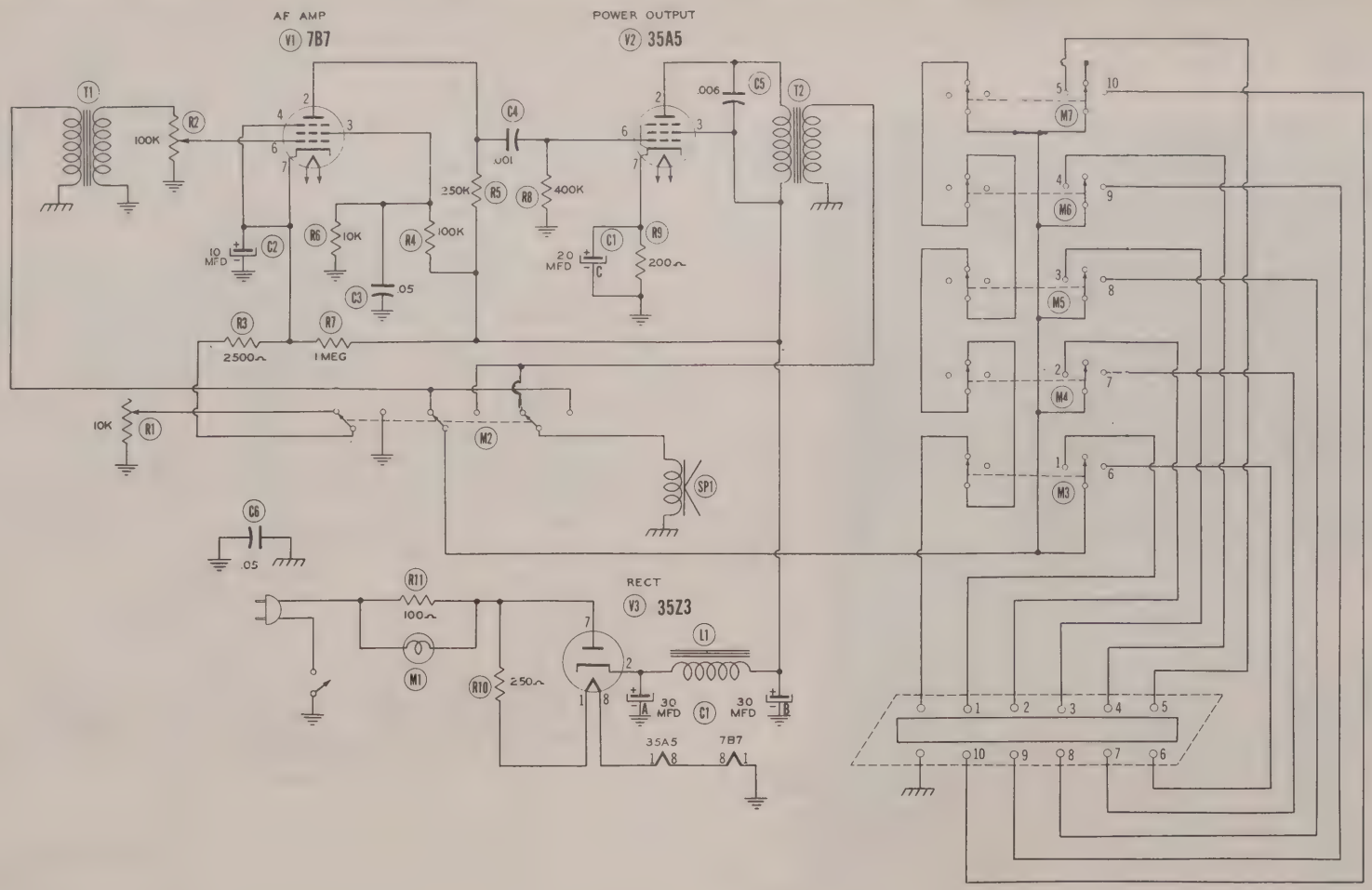
MISCELLANEOUS

ITEM No.	PART NAME	BELL SOUND PART No.	NOTES
M2	Switch		Send-Receiver
M3	Switch		Station Selector (1 and 6)
M4	Switch		Station Selector (2 and 7)
M5	Switch		Station Selector (3 and 8)
M6	Switch		Station Selector (4 and 9)
M7	Switch		Station Selector (5 and 10)

CHASSIS—BOTTOM VIEW



BELL SOUND MODEL 350



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	7B7	0V	65VDC	10.9VDC	1.8VDC	0V	0V	1.8VDC	7VAC
V 2	35A5	7VAC	105VDC	110VDC	110VDC	0V	0V	8.4VDC	40VAC
V 3	35Z3	75VAC	115VAC	115VAC	0V	110VDC	0V	130VDC	40VAC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	7B7	0Ω	†250KΩ	10KΩ	†70KΩ	Inf.	0Ω 28Ω	10KΩ	7Ω
V 2	35A5	7Ω	†630Ω	†470Ω	†470Ω	Inf.	400KΩ	200Ω	42Ω
V 3	35Z3	77Ω	350Ω	350Ω	0Ω	†470Ω	Inf.	500KΩ	42Ω

SEND AND RECEIVE SWITCH IN RECEIVE POSITION. † MEASURED FROM PIN 7 OF V3.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL 696L

EMERSON MODELS 676F, 681F,
686F, L, 687F, L, 696F, L

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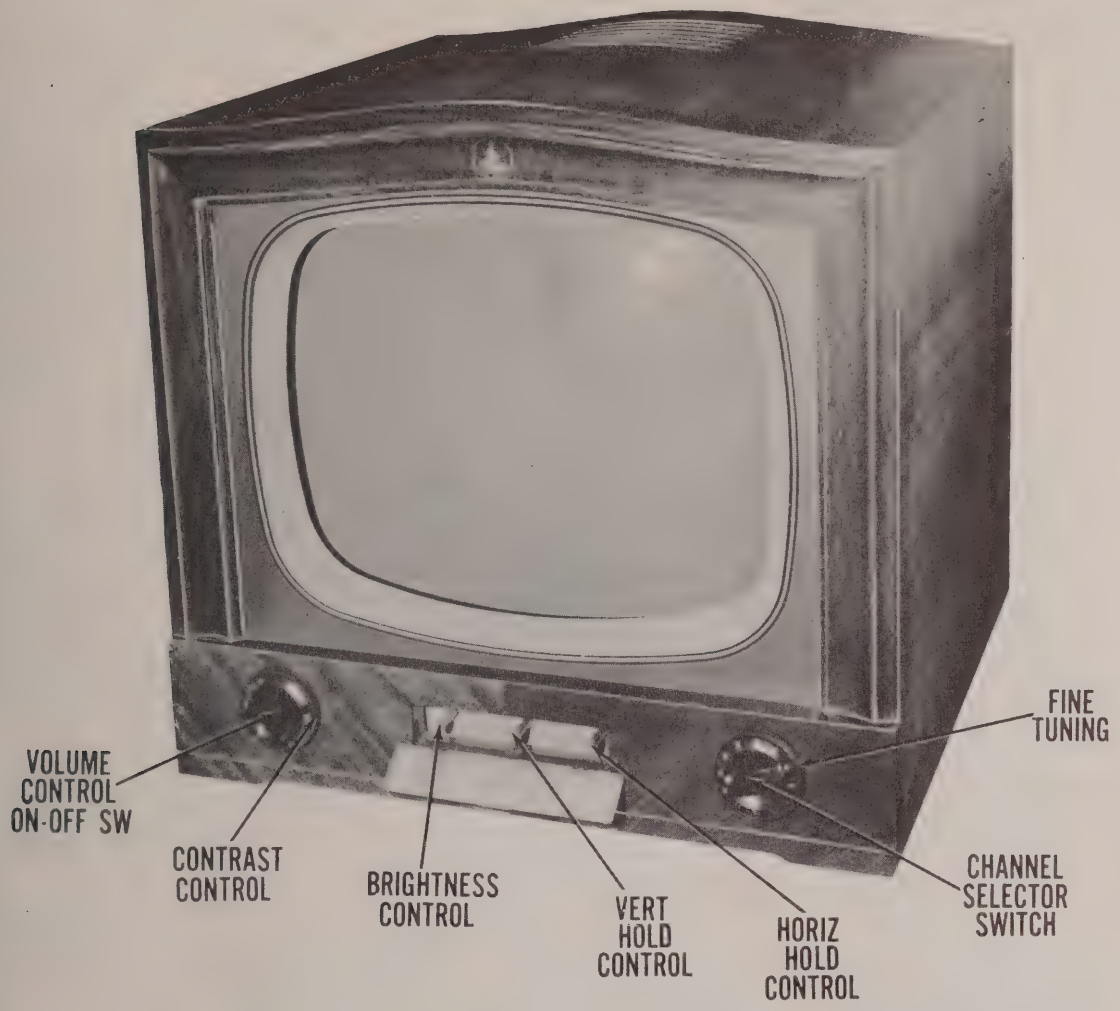
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1951 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 10-51 SET 148 FOLDER 6



EMERSON MODELS 676F, 681F, 686F, L, 687F, L, 696F, L

EMERSON MODEL 696L

TRADE NAME	Emerson, Models 676F, 681F, 686F, L, 687F, L, 696F, L (Ch. 120142B, 43B, 43H)
MANUFACTURER	Emerson Radio and Phono Corp., 111 Eighth Ave., New York, N. Y.
TYPE SET	Television Receiver
TUBES	Twenty three
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.55 Amp. at 117 Volts AC
TUNING RANGE—CHANNELS	2 thru 13

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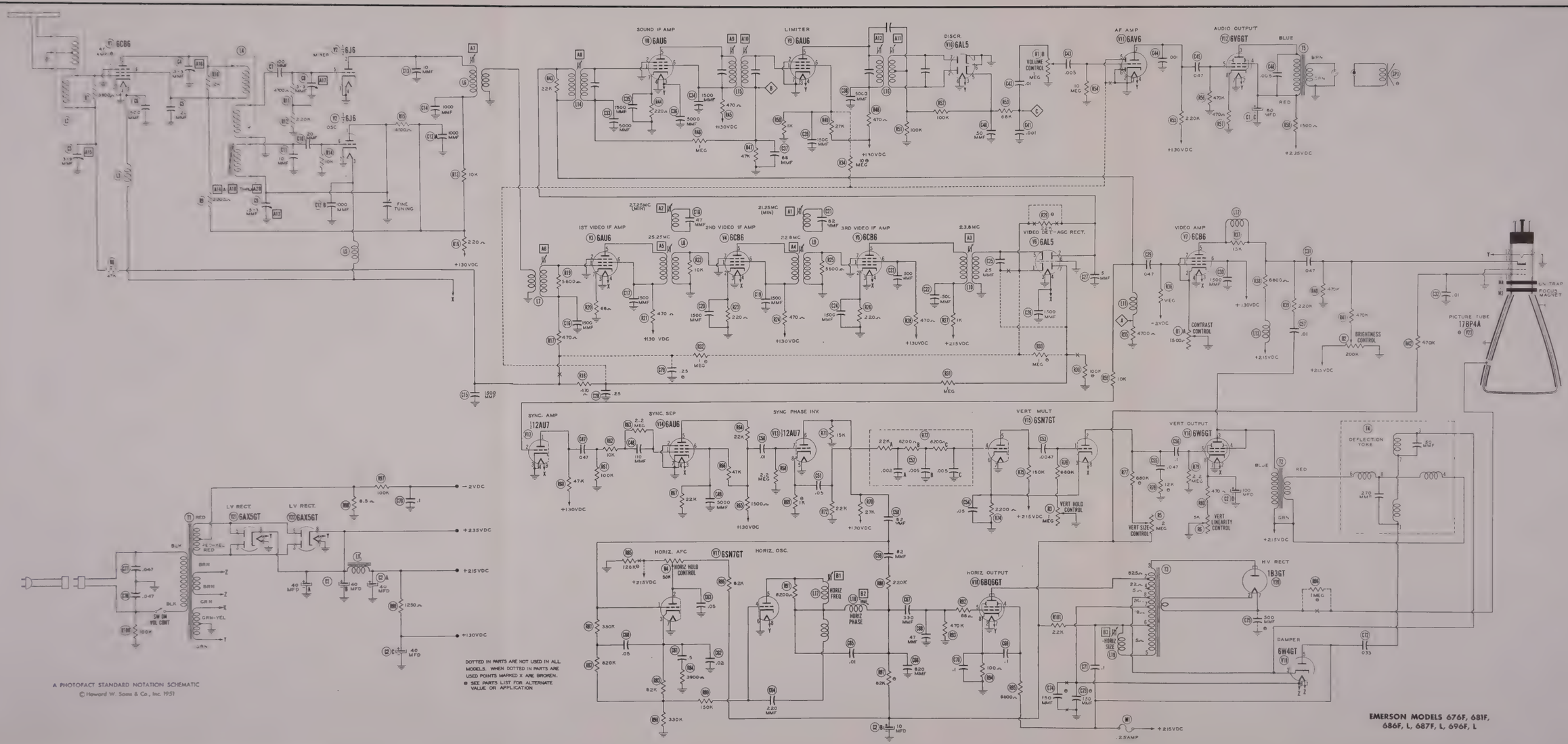

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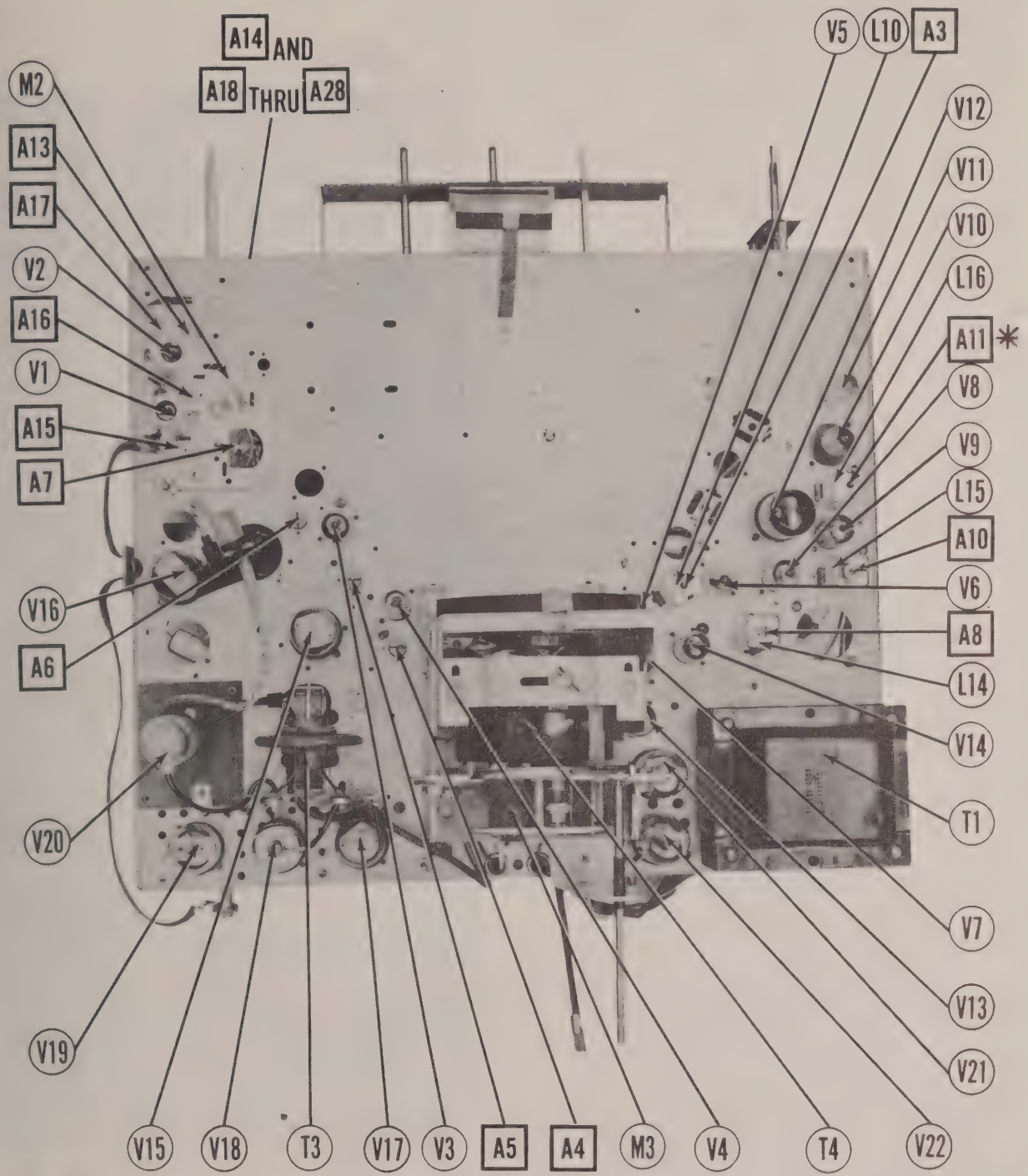
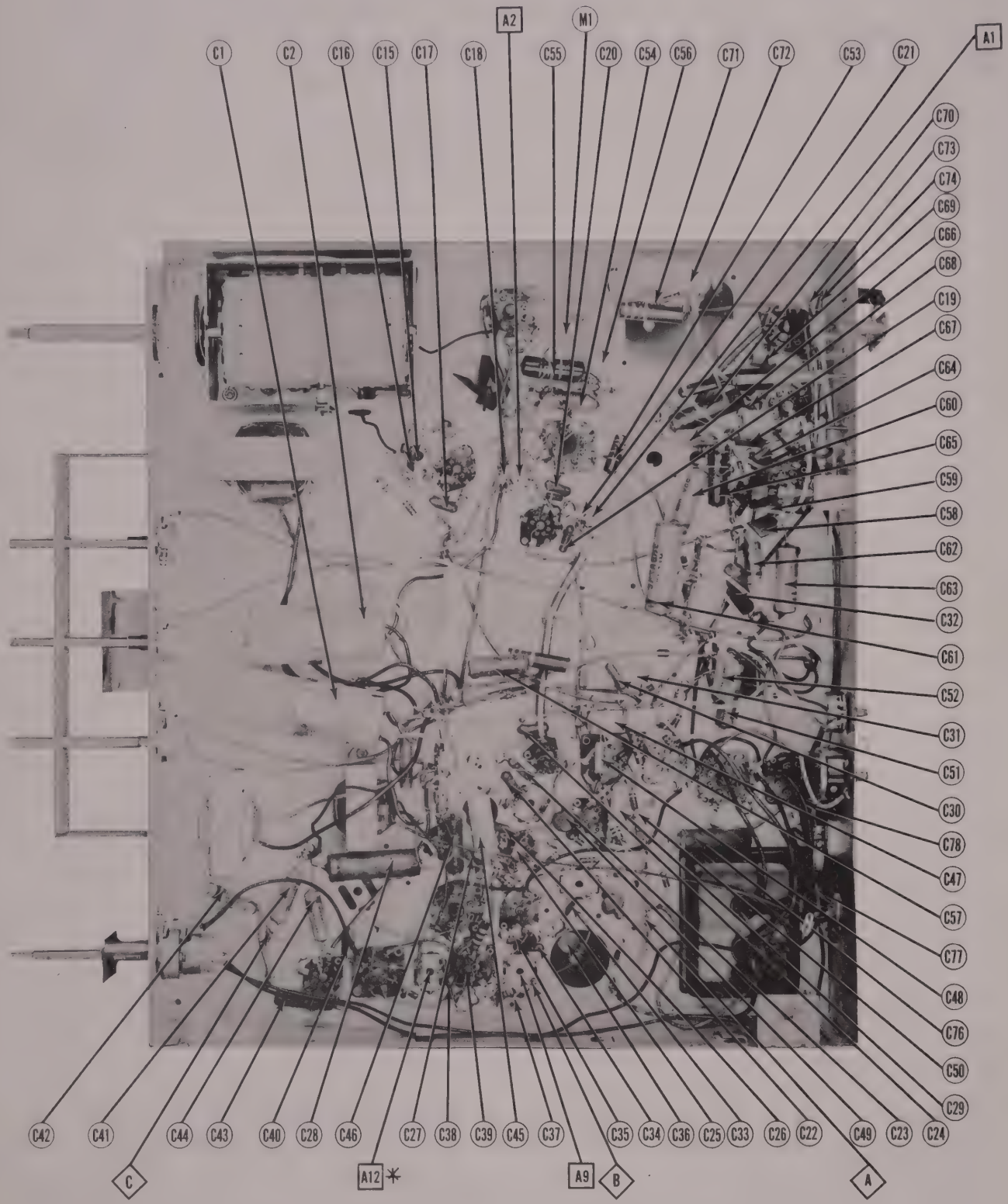
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
Ⓐ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

EMERSON MODELS 676F, 681F, 686F, L, 687F, L, 696F, L



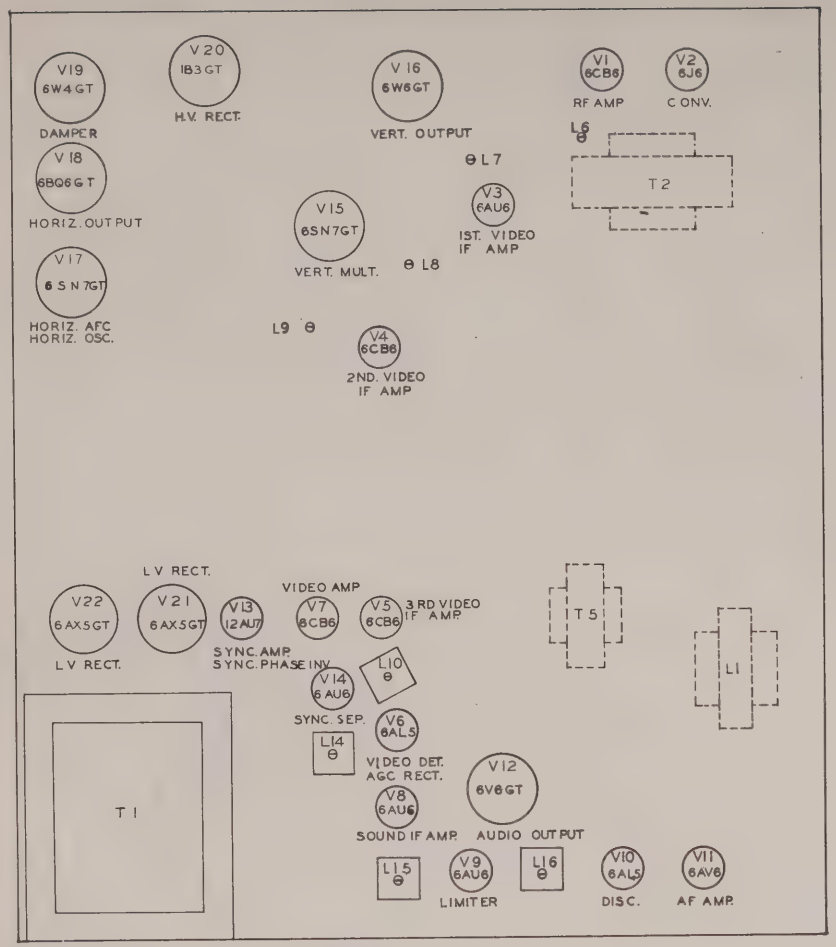
* SEE NOTE IN ALIGNMENT INSTRUCTIONS

CHASSIS TOP VIEW

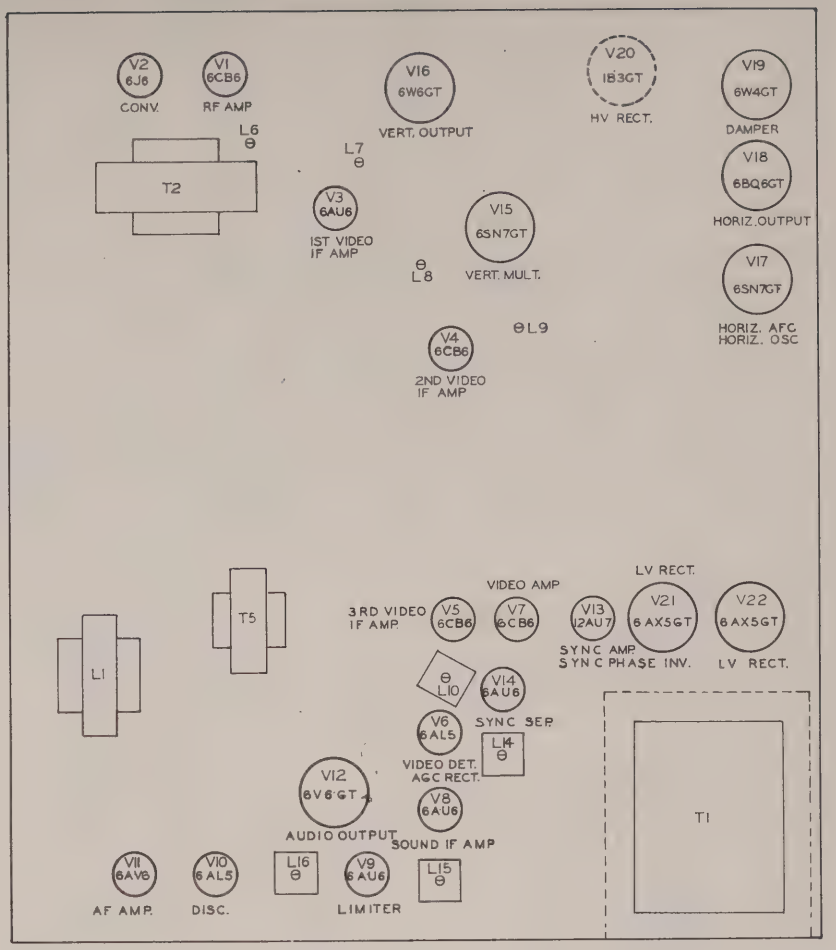


*SEE NOTE IN ALIGNMENT INSTRUCTIONS

CHASSIS BOTTOM VIEW- CAPACITOR AND ALIGNMENT IDENTIFICATION



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

EMERSON MODELS 676F, 681F, 686F, L, 687F, L, 696F, L

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube, (V2), and replace it with a 6J6 which has pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded lead of C28, connect the positive lead to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD.	High side to pin 1, (Grid) of 6AU6, (V3). Low side to chassis.	Not used.	21.25MC (unmod.)	Any	USE VTVM DC Probe to Point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	"	27.25MC	"	"	A2	"
3.	"	"	"	23.8MC	"	"	A3	Adjust for maximum deflection.
4.	"	"	"	22.8MC	"	"	A4	"
5.	"	"	"	25.25MC	"	"	A5	"
6.	"	"	24MC (10MC SWP)	21.25MC 22.25MC 25.75MC		Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.		Check for response curve similar to fig. 1. If necessary retouch A5 for proper response curve, A4 to place 25.75MC marker properly, and A3 to flatten top of response curve.
7.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	"	21.75MC 25.75MC	"	Vert. Amp. thru detector probe, (fig.2) to pin 5, (plate), of 6AU6, (V3). Low side to chassis.	A6, A7	Adjust for response curve similar to fig. 3 with markers as shown.
8.	"	"	"	21.25MC 22.25MC 25.75MC	"	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.		Check for overall response curve similar to fig. 1. If necessary retouch A3, A4, and A5 for proper response.

SOUND IF ALIGNMENT

These receivers employ one of two discriminator transformers. Transformer # 708018 has the secondary on top. Transformer # 708017 has the secondary on the bottom.
Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.001MFD.	High side to pin 2, (plate) of 6AL5, (V6). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. thru 10KΩ to Point (B). Low side to chassis.	A8, A9, A10	Adjust for maximum amplitude and symmetry as per fig. 4.
10.	"	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A11, A12	Adjust A11 so 4.5MC occurs at center of crossover lines as per fig. 5. Adjust A12 for maximum amplitude and straightness of crossover lines.

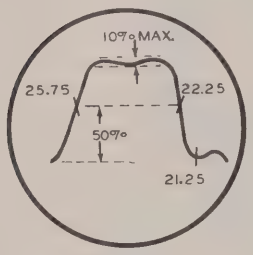


FIG. 1

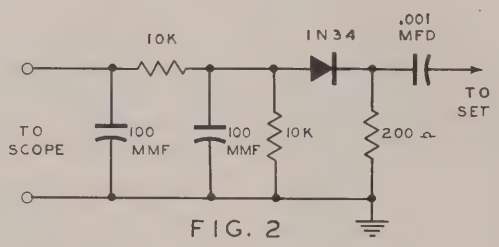


FIG. 2

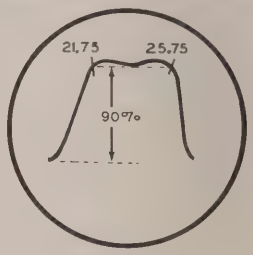


FIG. 3

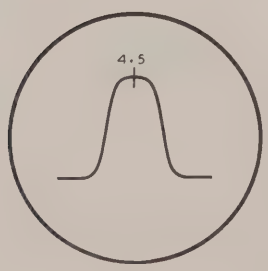


FIG. 4

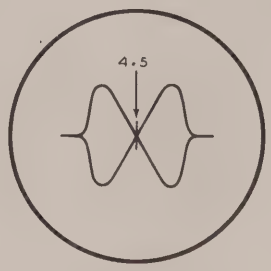


FIG. 5

ALIGNMENT INSTRUCTIONS (CONT.)

RF ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The overall oscillator circuit adjustment, (A13), has been properly set and should not be adjusted.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.	A14	Adjust to place sound marker as shown in fig. 6. The video marker should be at 50%.
12.	"	"	"	"	"	"	A15, A16 A17	Adjust for maximum amplitude of response curve.
13.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"	A18	Adjust to place sound marker as shown in fig. 6. The video marker should be at 50%.
			201MC (10MC SWP)	199.25MC 203.75MC	11		A19	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A20	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A21	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A22	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A23	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A24	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A25	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A26	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A27	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A28	

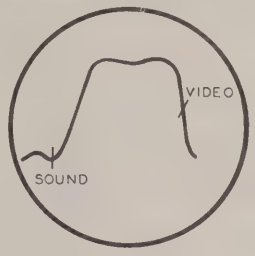


FIG. 6

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a short across L18.

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to fully counter-clockwise.

Starting with the slug fully out, adjust the horizontal frequency slug, (B1), clockwise until the picture synchronizes horizontally.

Remove the short from L18.

Connect the vertical input lead of an oscilloscope thru a 22KΩ resistor to the junction of L17 and L18.

Adjust the horizontal phase slug, (B2), until the broad and narrow peaks of the waveform on the scope are of equal height as shown in fig. 7.

If necessary during adjustment of B2, adjust B1 to keep the picture synchronized.

Adjust the horizontal size slug, (B3), until the picture is slightly wider than necessary to fill the mask horizontally.

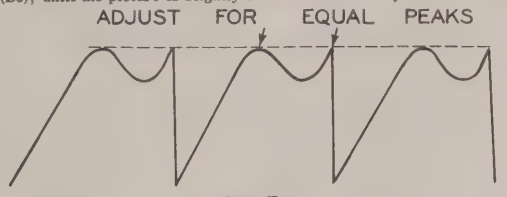


FIG. 7

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove six wood screws from rear cover. Remove rear cover.
3. Disconnect built-in antenna.
4. Disconnect speaker.
5. Remove four 7/16" hex head bolts from chassis. Remove chassis.
6. Remove two 5/16" hex nuts from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	-1.2VDC	0V	6.3VAC	0V	90VDC	90VDC	0V		
V 2	6J6	95VDC	90VDC	6.3VAC	0V	.8VDC	§-3.2VDC	0V		
V 3	6AU6	-.4VDC	0V	0V	6.3VAC	125VDC	125VDC	.5VDC		
V 4	6CB6	0V	2.5VDC	0V	6.3VAC	125VDC	125VDC	0V		
V 5	6CB6	0V	2.5VDC	0V	6.3VAC	205VDC	125VDC	0V		
V 6	6AL5	-.1VDC	-.2VDC	0V	6.3VAC	0V	0V	-.7VDC		
V 7	6CB6	-.3VDC	2.4VDC	6.3VAC	0V	205VDC	130VDC	2.4VDC		
V 8	6AU6	-.1VDC	0V	6.3VAC	0V	125VDC	125VDC	1.4VDC		
V 9	6AU6	-.7VDC	0V	0V	6.3VAC	125VDC	35VDC	0V		
V 10	6AL5	0V	-.7VDC	6.3VAC	0V	0V	0V	-.6VDC		
V 11	6AV6	-.6VDC	0V	0V	6.3VAC	0V	0V	70VDC		
V 12	6V6GT	0V	6.3VAC	180VDC	190VDC	0V	130VDC	0V	12VDC	
V 13	12AU7	28VDC	-.3VDC	0V	0V	0V	36VDC	0V	1.2VDC	6.3VAC
V 14	6AU6	-1.1VDC	0V	6.3VAC	0V	115VDC	40VDC	0V		
V 15	6SN7GT	§-18VDC §-24VDC	40VDC 95VDC	2.7VDC	§0V	70VDC	2.7VDC	0V	6.3VAC	
V 16	6W6GT	0V	6.3VAC	190VDC 210VDC	100VDC 210VDC	0V	0V 34VDC	0V	21VDC 36VDC	
V 17	6SN7GT	§-22VDC §-29VDC	160VDC 230VDC	-1.4VDC	§-82VDC §-87VDC	220VDC	0V	0V	6.3VAC	
V 18	6BQ6GT	0V	0V	0V	155VDC	-5VDC -6.3VDC	-4.9VDC -6.2VDC	6.3VAC	11.6VDC	Top Cap *
V 19	6W4GT	0V	0V	460VDC	0V	215VDC	0V	460VDC	460VDC	
V 20	1B3GT	* DO NOT MEASURE								Top Cap *
V 21	6AX5GT	0V	6.3VAC	255VAC	0V	255VAC	0V	0V	235VDC	
V 22	6AX5GT	0V	6.3VAC	255VAC	0V	255VAC	0V	0V	235VDC	
V 23	17BP4A	0V	0V	PIN 10 350VDC	PIN 11 0V 105VDC	PIN 12 6.3VAC	H.V. CONNECTOR ** 13K.V.			

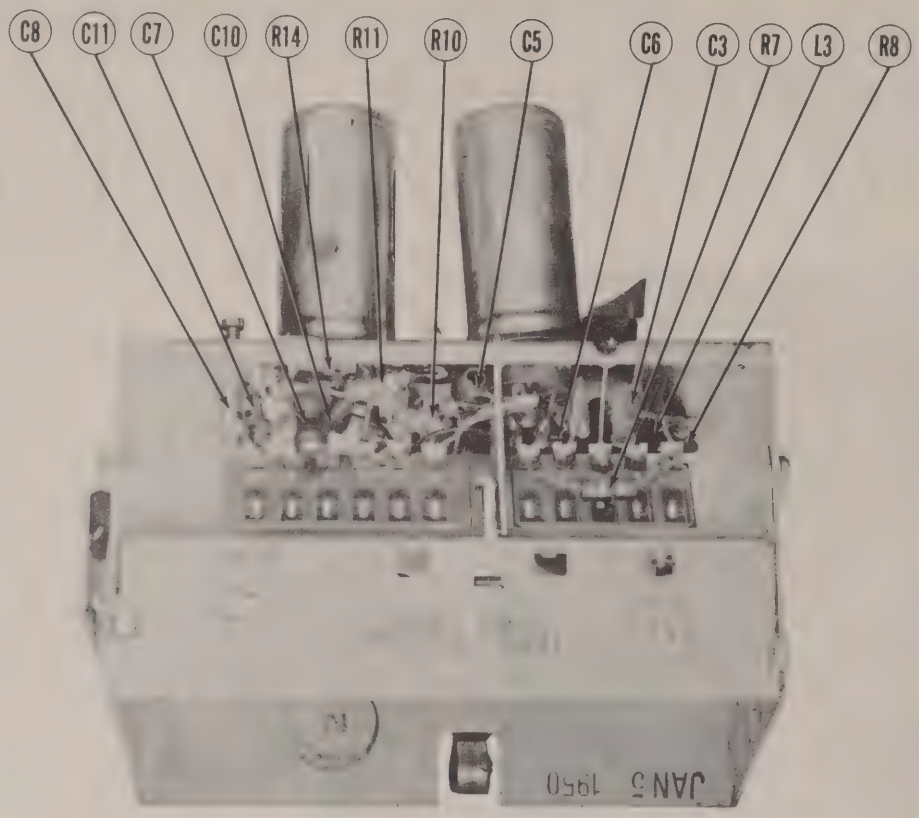
ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
§ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT MEASURE
** USE EXTREME CATUION WHEN MEASURING THIS VOLTAGE

RESISTANCE READINGS

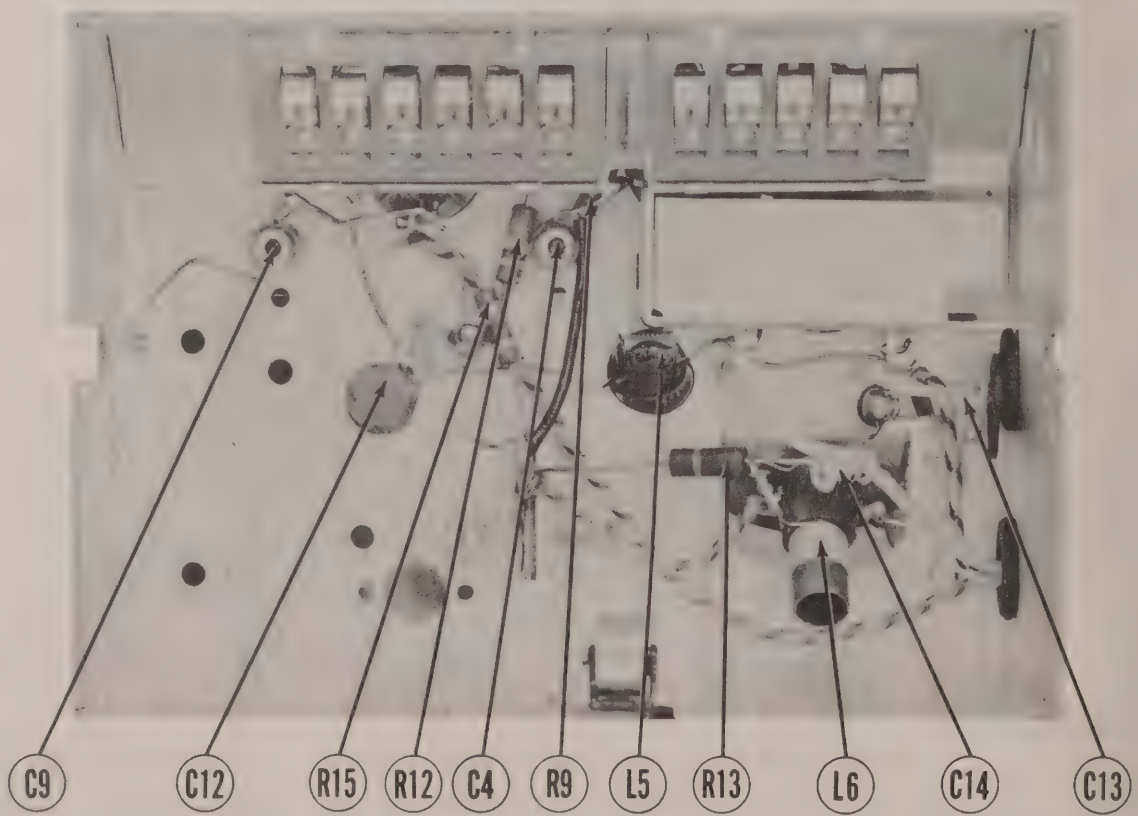
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	1.1Meg	0Ω	.1Ω	0Ω	†3.6KΩ	†3.6KΩ	0Ω		
V 2	6J6	†5.9KΩ	†11KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6AU6	1.1Meg	0Ω	0Ω	.1Ω	†1.7KΩ	†1.7KΩ	68Ω		
V 4	6CB6	.3Ω	220Ω	0Ω	.1Ω	†1.7KΩ	†1.7KΩ	0Ω		
V 5	6CB6	.3Ω	220Ω	0Ω	.1Ω	†1KΩ	†1.7KΩ	0Ω		
V 6	6AL5	26KΩ	4.7KΩ	0Ω	.1Ω	1.4Ω	0Ω	100KΩ		
V 7	6CB6	1.1Meg	1.5KΩ	.1Ω	0Ω	†6.9KΩ	†1.2KΩ	1.5KΩ		
V 8	6AU6	1Meg	0Ω	.1Ω	0Ω	†1.7KΩ	†1.7KΩ	220Ω		
V 9	6AU6	47KΩ	0Ω	0Ω	.1Ω	†1.7KΩ	†16KΩ	0Ω		
V 10	6AL5	0Ω	100KΩ	.1Ω	0Ω	200KΩ	0Ω	100KΩ		
V 11	6AV6	10Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	†220KΩ		
V 12	6V6GT	Inf.	.1Ω	†1.9KΩ	†1.5KΩ	470KΩ	†1.2KΩ	0Ω	470Ω	
V 13	12AU7	†48KΩ	14KΩ	0Ω	0Ω	0Ω	†12KΩ	2.2Meg	1KΩ	.1Ω
V 14	6AU6	2.3Meg	0Ω	.1Ω	0Ω	†24KΩ	†15KΩ	0Ω		
V 15	6SN7GT	1.6Meg 680KΩ	#2.7Meg #700KΩ	2.2KΩ	60KΩ	†150KΩ	2.2KΩ	0Ω	.1Ω	
V 16	6W6GT	Inf.	.1Ω	†365Ω	†365Ω	2.2Meg	0Ω 5KΩ	0Ω	5.4KΩ 470Ω	
V 17	6SN7GT	1.4Meg	#125KΩ #100KΩ	410KΩ	480KΩ	#105KΩ	0Ω	0Ω	.1Ω	
V 18	6BQ6GT	Inf.	0Ω	Inf.	†6.8KΩ	470KΩ	470KΩ	.1Ω	100Ω	Top Cap #27Ω
V 19	6W4GT	Inf.	Inf.	100KΩ	Inf.	†75Ω	Inf.	#22Ω	#22Ω	
V 20	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								Top Cap #900Ω
V 21	6AX5GT	Inf.	.1Ω	27Ω	Inf.	28Ω	Inf.	0Ω	13KΩ	
V 22	6AX5GT	Inf.	.1Ω	27Ω	Inf.	88Ω	Inf.	0Ω	13KΩ	
V 23	17BP4A	0Ω	0Ω	PIN 10 #490KΩ	PIN 11 †250KΩ	PIN 12 .1Ω				

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
† MEASURED FROM PIN 8 OF V21 AND V22
# MEASURED FROM PIN 3 OF V19

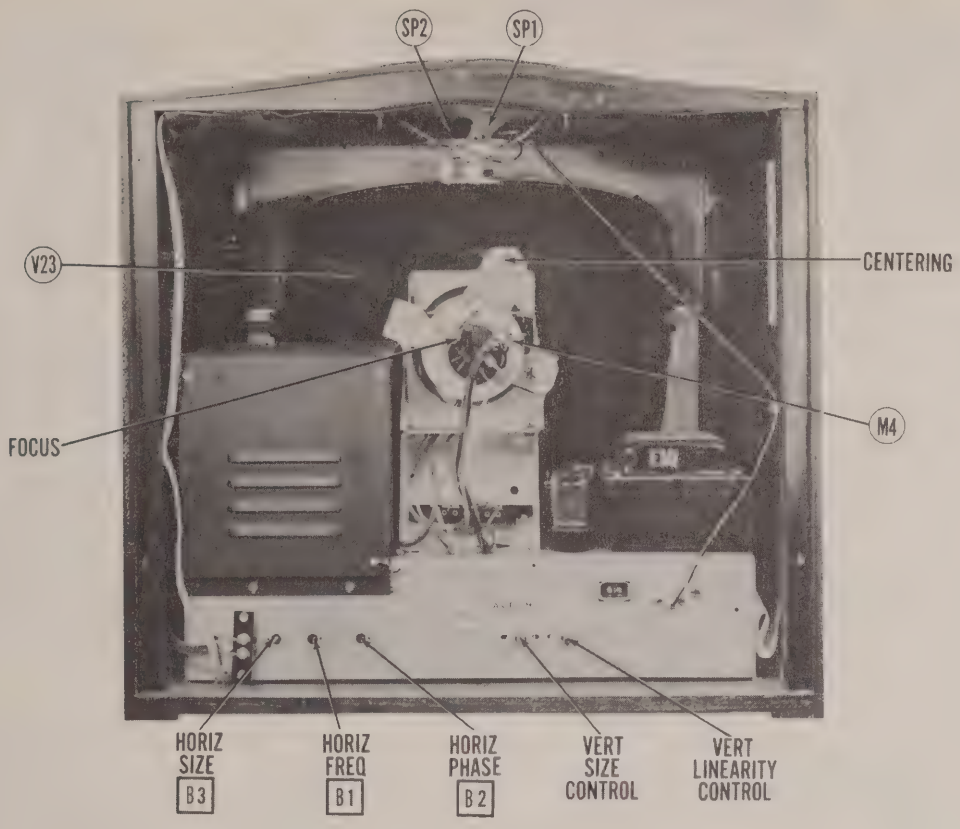
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



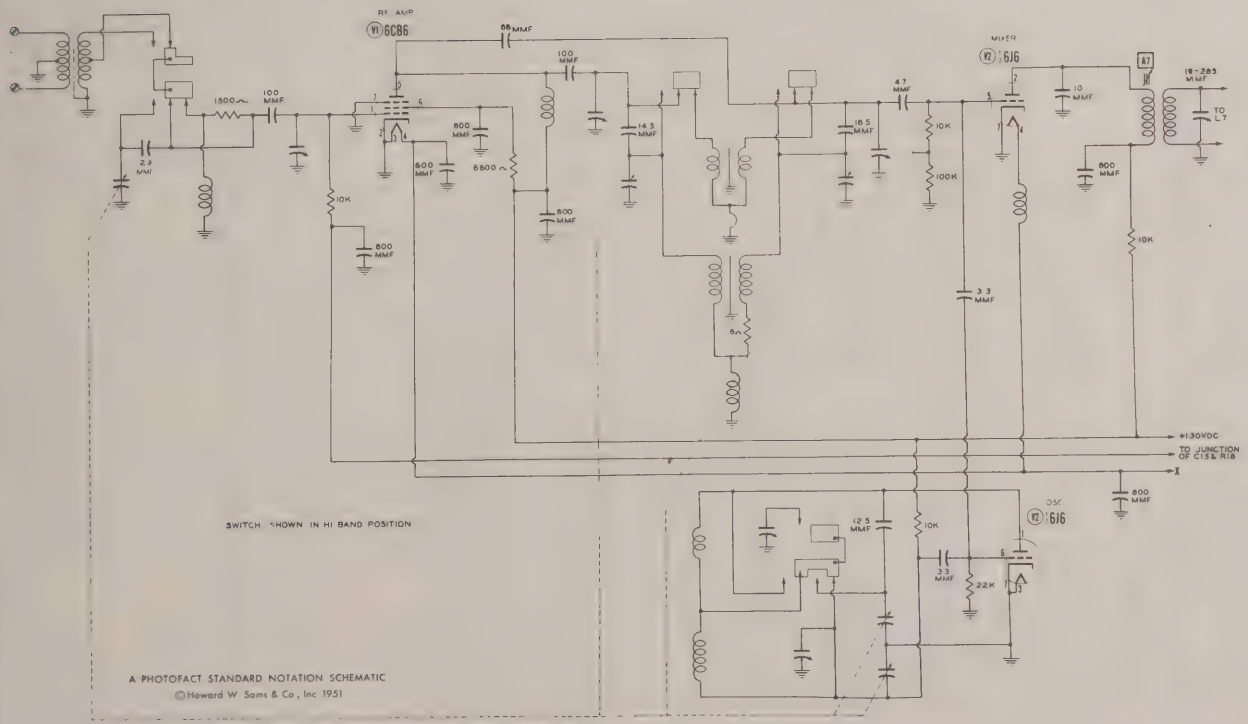
RF TUNER- TOP VIEW



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW



ALTERNATE TUNER SCHEMATIC

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	800055	6CB6	7CM	
B	RF Amplifier	800052	6BC5	7BD	
C	RF Amplifier	800535	6AG5	7BD	
V2	Converter	800536	6J8	7BF	
V3	1st. Video IF Amp.	800550	6AU6	7BK	
V4	2nd Video IF Amp.	800046	6CB6	7CM	
V5	3rd. Video IF Amp.	800055	6CB6	7CM	
V6	Video Detector-AGC Rectifier	800541	6AL5	6BT	
V7	Video Amplifier	800055	6CB6	7CM	
V8	Sound IF Amp.	800533	6AU6	7BK	
V9	Limiter	800532	6AU6	7BK	
V10	Discriminator	800541	6AL5	6BT	
V11	AF Amplifier	800057	6AV6	7BT	
V12	Audio Output	800270	6V6GT	7AC	
V13	Sync Amplifier - Sync Phase Inv.	800026	12AU7	9A	
V14	Sync Separator	800055	6AU6	7BK	
V15	Vert Mult	800380	6SN7GT	8BD	
V16	Vert Output	800061	6V6GT	7S	
V17	Horiz. AFC-Horiz Oscillator	800081	6SN7GT	8BD	
V18	Horiz. Output	800059	6BQ6GT	6AM	
V19	Damper	800037	5W4GT	4CG	
V20	HV Rectifier	800450	1B3GT	3C	
V21	LV Rectifier	800062	6AX5GT	6S	
V22	LV Rectifier	800062	6AX5GT	6S	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: EMERSON PART No.	SYLVANIA PART No.	THOMAS PART No.	RTMA BASE TYPE	NOTES
V23A	17BP4A	17BP4A	17BP4	12D	
B	17CP4				

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	300	925197			UP8445		TVA-3585	Filter
B	40	300				BR4035			Filter
C	40	300							Audio Output Dec.
C2A	40	300	925198			UPT403		R1154	Filter
B	10	450							Vert. Osc. Decoupling
C	40	250							Filter
D	100	50							Vert. Output Cathode
C3	5-9				829-10				Variable Trimmer
C4	5-3				829-3				Variable Trimmer
C5	120				TCN-120		N750L-121		RF Amp. Decoupling
C6	1500			SI1500	D6-152		GP2L-152	5HK-D15	RF Amp. Fil.
C7	100			SI100N750	TCN-100		N750L-101	5TCU-T1	RF Coupling
C8	5-3				829-3				Variable Trimmer
C9	5-3				829-3				Variable Trimmer
C10	20			SI20NP0	TCZ-20		N750K-200		Osc. Grid Cap.
C11	10			SI10N750	TCN-10		N750K-100	5TCU-Q1	Fixed Trimmer
C12A	.1000			BPD-2X001	DD-2-102		812-001	5HK-2D1	RF Bypass
B	.1000								Conv. Fil.
C13	10			SI10N750	TCN-10		N750K-100	5TCU-Q1	Fixed Trimmer
C14	1000			SI1000	D6-102		GP2L-102	5HK-D1	Mixer Plate Dec.
C15	1500		928006	SI1500	D6-152	1WSD15	GP2L-152	5HK-D15	AGC Filter
C16	1500		928006	SI1500	D6-152	1WSD15	GP2L-152	5HK-D15	AGC Filter
C17	1500		928006	SI1500	D6-152	1WSD15	GP2L-152	5HK-D15	1st. Video IF Dec.
C18	47				TCZ-47		NP0L-470	5TCC-Q47	Fixed Trimmer
C19	1500		928006	SI1500	D6-152	1WSD15	GP2L-152	5HK-D15	2nd. Video IF Dec.
C20	1500		928006	SI1500	D6-152	1WSD15	GP2L-152	5HK-D15	2nd. Video IF Cathode
C21	82				TCZ-82		NP0-333-820		Fixed Trimmer
C22	1500		928006	SI1500	D6-152	1WSD15	GP2L-152	5HK-D15	3rd. Video IF Plate
C23	1500		928006	SI1500	D6-152	1WSD15	GP2L-152	5HK-D15	3rd. Video IF Screen
C24	1500		928006	SI1500	D6-152	1WSD15	GP2L-152	5HK-D15	3rd. Video IF Cathode
C25	33		928110	SI33	D6-250	5W5Q35	GP1K-250	5GA-Q35	IF Coupling
C26	1500		928006	SI1500	D6-152	1WSD15	5HK-D15		Video Det. Fil.
C27	5		928017	SI5N750			N750K-050		Video Det. Filter
C28	.25	200	921330	P488-25		GT2P25		2TM-P25	AGC Filter
C29	.047	400	922554	P488-047	DF-503	PTE4S5		4TM-S47	Video Coupling
C30	1500		928006	SI1500	D6-152	1WSD15	GP2L-152	5HK-D15	Video Amp. Screen
C31	.047	400	922554	P488-047	DF-503	PTE4S5		4TM-S47	Video Coupling
C32	.01	600	921714	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Accelerating Anode Dec.
C33	5000		928109	BPD-005	DD-005	1DSD5	811-005	5HK-D5	AVC Filter
C34	1500		928006	SI1500	D6-152	1WSD15	GP2L-152	5HK-D15	Sound IF Decoupling
C35	1500		928006	SI1500	D6-152	1WSD15	GP2L-152	5HK-D15	Sound IF Cathode
C36	5000		928109	BPD-005	DD-502	1DSD5	811-005	5HK-D5	Sound IF Fil.
C37	68	500	910221	1469-00007	D6-680	5W5Q7	GP1K-680	MS-47	Limiter Grid Filter
C38	5000		928109	BPD-005	DD-502	1DSD5	811-006	5HK-D5	Limiter Plate Dec.
C39	1500		928006	SI1500	D6-152	1WSD15	GP2L-152	5HK-D15	Limiter Screen
C40	50	500	910222	1468-00005	D6-500	5W5Q35	GP1K-500	1FM-45	RF Bypass
C41	.001	600	921713	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	De-emphasis
C42	.01	400	921514	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C43	.005	600	921753	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C44	.001	600	921713	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	AF Amp. Plate
C45	.047	400	922554	P488-047	DF-503	PTE4S5		4TM-S47	Audio Coupling
C46	.005	600	921753	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Output Plate
C47	.047	400	922554	P488-047	DF-503	PTE4S5		4TM-S47	Sync. Coupling
C48	130	500	910043	1469-0001	TCZ-130	5R5T1	NP0-333-131	MS-31	Sync. Coupling
C49	5000		928109	BPD-005	DD-502	1DSD5	811-005	5HK-D5	Sync. Sep. Screen *

CAPACITORS (CONT.)

ITEM No	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C50	.01	400	922514	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Sync. Coupling
C51	.05	400	921554	P488-05	DF-503	PTE4S5		4TM-S5	Vert. Sync. Coupling
C52A	.002		P688-002			PTE6D2	GP2-333-202		Vert. Integrator Net.
B	.005		923026	P688-005	PC-100	PTE6D5	GP2-333-502	101C1	Vert. Integrator Net.
C	.005			P688-005		PTE6D5	GP2-333-502		Vert. Integrator Net.
C53	.0047	400	922453	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Vert. MV Feedback
C54	.05	400	921354	P488-05	DF-503	PTE4S5		4TM-S5	Vert. MV Cathode
C55	.047	600	922654	P688-047	DF-503	PTE6S5		6TM-S47	Vert. Discharge
C56	1	600	922715	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C57	.01	600	921714	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Vert. Sweep Coupling
C58	82	500	910056		TCZ-82		NP0-333-820		Horiz. Sync. Coupling
C59	82	500	910056		TCZ-82		NP0-333-820		Horiz. Feedback
C60	.05	400	921554	484-5		GT4P5		4TM-P5	AFC Filter
C61	5	200	921355	P288-5		GT2P5		2TM-P5	AFC Filter
C62	.02	200	921324	P488-02	DF-203	PTE4S2		2TM-S2	AFC Filter
C63	.05	400	921554	P488-05	DF-503	PTE4S5		4TM-S5	AFC Plate
C64	220	500	910057	1469-00025		5R5T25			Horiz. Osc. Grid
C65	.01	600	922041	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Fixed Trimmer
C66	820	500	910218						Horiz. Discharge
C67	330	500	910059	1469-00035					Horiz. Sweep Coupling
C68	47	500	910058	1469-00005		5R5Q5		MS-45	Horiz. Output Grid
C69	.1	400	921515	P488-1	DF-104	PTE4P1		4TM-P1	Horiz. Output Screen
C70	.1	400	921515	P488-1	DF-104	PTE4P1		4TM-P1	Horiz. Output Cathode
C71	1	600	922715	P688-1	DF-104	PTE6P1		6TM-P1	Horiz. Sweep Coupling
C72	.033	1000	922834	P1088-033		PTE16S3		MB-S3	Horiz. Sweep Coupling
C73	150	2000							Damper Filter †
C74	150	2000							Damper Filter *
C75	500	20000	923016	HV20-C	TV3-502				HV Filter *
C76	.1	200	921315	P288-1	DF-104	PTE4P1		2TM-P1	Bias Filter
C77	.047	400	922200	P488-047	DF-503	PTE4S5		4TM-S47	Line Filter
C78	.047	400	922200	P488-047	DF-503	PTE4S5		4TM-S47	Line Filter
C79	.25	400		P488-25		GT4P25		4TM-P25	AGC Filter ¶

* Not used in all models.
† Some models use 300MMF. at 2000VDC in this application (Part # 928066)
♦ Items C52A, C52B, C52C, R73A, R73B, R73C are combined in one unit.
¶ Used on sets coded with triangle A and triangle D.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1500Ω	1/2		Concentrikit			
B	1Meg	1/2	390184	B17-110 ♂			Contrast Control - Front
C	Shaft end			B13-137 ♂	RTV-296		Volume Control - Rear
D	Switch			E187 ♂			Attach per instructions in Concentrikit
R2A	200KΩ	1/2	390181	76-1 ♂	AG-52-S	AN-50	Attach per instructions in Concentrikit
B	Shaft		Not req.	Q11-130 †	KSS-5	AK-4	Brightness Control
R3A	1Meg	1/2	390156	C3 #	AG-61-S	AN-69	Attach to R2A per instructions
B	Shaft		Not req.	Q11-137	KSS-5	AK-4	Vertical Hold Control
R4A	50KΩ	1/2	390183	C3 #	AG-44-S	AN-31	Attach to R3A per instructions
B	Shaft		Not req.	Q11-123	KSS-5	AK-4	Horiz. Hold Control
R5A	2Meg	1/2	390142	C3 #	AG-83-S	AN-75	Attach to R4A per instructions
B	Shaft		Not req.	Q11-139	FKS-1/4	AK-1	Vertical Size Control
R6	5000Ω	2	390143	Not req.	43-5000	VK-135	Attach to R5A per instructions
				W-5000			Vertical Linearity Control - Wire Wound

♂ Additional parts to be used with Concentrikit.
† When using this replacement shunt control with BTS-1Meg resistor.
# Use coupler with part of original shaft.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE SPECIFIED
R7	3900Ω	1/2		BTS-3900	Antenna Coil Shunt
R8	47KΩ 20%	1/2		BTS-47K	AGC Network
R9	2200Ω	1/2		BTS-2200	RF Amp. Decoupling
R10	10KΩ	1/2		BTS-10K	RF Coil Shunt
R11	4700Ω	1/2		BTS-4700	Mixer Grid
R12	220KΩ 20%	1/2		BTS-220K	Mixer Grid
R13	10KΩ 20%	1/2		BTS-10K	Mixer Decoupling
R14	10KΩ	1/2	340732	BTS-10K	Oscillator Grid
R15	4700Ω	1/2		BTS-4700	Oscillator Plate
R16	220Ω	1/2	340332	BTS-220	Decoupling
R17	470Ω 20%	1/2	350412	BTS-470	AGC Network
R18	470Ω 20%	1/2	350412	BTS-470	AGC Network
R19	56000Ω	1/2	340672	BTS-5600	1st. Video IF Transformer Shunt
R20	68Ω	1/2	340212		1st. Video IF Amp. Cathode
R21	470Ω 20%	1/2	350412	BTS-470	1st. Video IF Amp. Decoupling
R22	10KΩ	1/2	340732		2nd. Video IF Transformer Shunt
R23	220Ω	1/2	340332	BTS-220	2nd. Video IF Amp. Cathode
R24	470Ω 20%	1/2	350412	BTS-470	2nd. Video IF Amp. Decoupling
R25	5600Ω	1/2	340672		3rd. Video IF Transformer Shunt
R26	220Ω	1/2	340332	BTS-220	3rd. Video IF Amp. Cathode
R27	1000Ω 20%	1/2	340492	BTS-1000	3rd. Video IF Amp. Plate Decoupling
R28	470Ω 20%	1/2	350412	BTS-470	3rd. Video IF Amp. Screen
R29	22KΩ	1/2	340812	BTS-22K	AGC Network - See Note 1
R30	100KΩ	1/2	340972	BTS-100K	AGC Load - See Note 1
R31	1Meg 20%	1/2	351212	BTS-1Meg	AGC Network
R32	1Meg	1/2		BTS-1Meg	AGC Network - See Note 2
R33	1Meg	1/2		BTS-1Meg	AGC Load - See Note 2
R34	10Meg	1/2		BTS-10Meg	AGC Delay - See Note 2
R35	4700Ω	1/2	340652	BTS-4700	Video Detector Diode Load
R36	1Meg 20%	1/2	351212	BTS-1Meg	Video Amp. Grid
R37	15KΩ	1/2	340772	BTS-15K	Video Peaking Coil Shunt
R38	6800Ω 5%	2	347063	BTB-6800-5%	Video Amp. Plate
R39	220KΩ	1/2	341052	BTS-220K	Vertical Retrace Blanking Network
R40	470KΩ	1/2	351132	BTS-470K	Picture Tube Cathode
R41	470KΩ 20%	1/2	351132	BTS-470K	Picture Tube Cathode
R42	470KΩ 20%	1/2	251132	BTS-470K	Acc. Anode Load
R43	22KΩ	1/2	340812		Sound IF Transformer Shunt
R44	220Ω	1/2	340332	BTS-220	Sound IF Amp. Cathode
R45	470Ω 20%	1/2	350412	BTS-470	Sound IF Amp. Decoupling

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	IDENTIFICATION CODES
R46	1Meg 20%	1/2	351212		Sound IF Amp. Grid
R47	47KΩ	1/2	340892	BTS-47K	Limiter Grid
R48	470Ω 20%	1/2	350412	BTS-470	Limiter Plate Decoupling
R49	27KΩ	1	370832	BTA-27K	Limiter Screen
R50	10KΩ	1/2		BTS-10K	Voltage Divider
R51	100KΩ	1/2	340972	BTS-100K	Discriminator Diode Load
R52	100KΩ	1/2	340972	BTS-100K	Discriminator Diode Load
R53	68KΩ	1/2	340932	BTS-68K	De-emphasis
R54	10Meg 20%	1/2	351452	BTS-10Meg	AF Amp. Grid
R55	220KΩ	1/2	341052	BTS-220K	AF Amp. Plate
R56	470KΩ	1/2	351132	BTS-470K	Output Grid
R57	470Ω	1	370042	BTA-470	Output Cathode
R58	1500Ω 20%	2	397053	BTB-1500	Output Decoupling
R59	10KΩ	1/2	340732	BTS-10K	Isolation
R60	47KΩ	1/2	340892	BTS-47K	Sync. Amp. Plate
R61	100KΩ	1/2	340972	BTS-100K	Sync. Separator Grid
R62	10KΩ	1/2	340732	BTS-10K	Isolation
R63	2.2Meg	1/2	341292	BTS-2.2Meg	Isolation
R64	22KΩ 5%	1/2	340812	BTS-22K-5%	Sync. Separator Plate
R65	1500Ω	1/2	340532	BTS-1500	Sync. Separator Plate
R66	47KΩ	1/2	370892	BTA-47K	Sync. Separator Screen
R67	22KΩ	1/2	340812	BTS-22K	Voltage Divider
R68	2.2Meg	1/2	341292	BTS-2.2Meg	Sync. Phase Inv. Grid
R69	1000Ω	1/2	340492	BTS-1000Ω	Sync. Phase Inv. Cathode - See Note 3
R70	27KΩ	1	370832	BTA-27K	Sync. Phase Inv. Plate
R71	15KΩ	1/2	340772	BTS-15K	Voltage Divider
R72	22KΩ	1/2	340812	BTS-22K	Voltage Divider
R73A	22KΩ	1/2		BTS-22K	Integrator
B	8200Ω	1/2	923026 ♦	BTS-8200	Integrator
C	8200Ω	1/2		BTS-8200	Integrator
R74	2200Ω	1/2	340572	BTS-2200	Vertical MV Cathode
R75	150KΩ	1/2	331012	BTS-150K	Vertical MV Plate
R76	680KΩ	1/2	341172	BTS-680K	Vertical MV Grid
R77	680KΩ	1/2	341172	BTS-680K	Vertical MV Plate - See Note 4
R78	12KΩ	1/2	340752	BTS-12K	Vertical Peaking - See Note 6
R79	2.2Meg	1/2	341292	BTS-2.2Meg	Vertical Output Grid
R80	470Ω 20%	1/2	350412	BTS-470	Vertical Output Cathode
R81	330KΩ	1/2	331092	BTS-330K	Horiz. AFC Grid
R82	820KΩ	1/2	341192	BTS-820K	Horiz. AFC Grid
R83	82KΩ	1/2	340952	BTS-82K	Horiz. AFC Cathode
R84	3900Ω	1/2	340632	BTS-3900	AFC Filter
R85	120KΩ	1/2	340992	BTS-120K	Voltage Divider - See Note 7
R86	82KΩ	1	370952	BTA-82K	Horiz. AFC Plate
R87	82KΩ	1/2	340952	BTS-82K	Horiz. Osc. Plate - See Note 5
R88	220KΩ	1/2	341052	BTS-220K	Feedback Network
R89	150KΩ	1/2	331012	BTS-150K	Horiz. Osc. Grid
R90	330KΩ	1/2	331092	BTS-330K	Horiz. AFC Cathode
R91	8200Ω	1/2	340712	BTS-8200	Horiz. Osc. Coil Shunt
R92	68Ω	1/2	340212		Parasitic Suppressor
R93	470KΩ	1/2	341132	BTS-470K	Horiz. Output Grid
R94	100Ω	2	397027	BW-2-100	Horiz. Output Cathode - Wire Wound
R95	6800Ω	2	397072	BTB-6800	Horiz. Output Screen
R96	1Meg 20%	1	381212		High Voltage Filter - See Note 7
R97	100KΩ	1/2	340972	BTS-100K	Bias Filter
R98	8.5Ω	5	394122		Voltage Divider - Wire Wound
R99	1250Ω	10	394116	1 3/4A-1250	Filter - Wire Wound
R100	22KΩ	1	370972	BTA-100K	Isolation
R101	22KΩ	1/2	340812	BTS-22K	Decoupling

♦ Items R73A, R73B R73C, C52A, C52B, C52C are combined in one unit.
Note 1 Not used in models coded with triangle A and D.
Note 2 Used only in models coded with Triangle A and D.
Note 3 Models coded with triangle A use 470Ω in this application.
Note 4 Models coded with triangle F and C use 1MegΩ in this application.
Note 5 Models coded with triangle C use 68KΩ in this application.
Note 6 Some models use series resistors in this application to obtain desired value.
Note 7 Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ② 1.55A	500VCT .240ADC	6.3VAC ② 1.2A	12.6VCT ② 5A	730032		P-3066	

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	270Ω		738059				Vert. Output Trans.
T3	Tap .8Ω 800Ω Taps ② 5Ω, 24Ω 48Ω, 53Ω 75Ω		738060				Horiz. Output Trans.
T4A	45Ω		708043				Horiz. Deflection Coils
B	3.5Ω						Vert. Deflection Coils

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T5	5.2KΩ	3.6Ω	330Ω	.7Ω	734051	A-3849	A-3019	RO-9 ①	① Drill one new mounting hole.

EMERSON MODELS 676F, 681F, 686F, L, 687F, L, 696F, L

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	EMERSON PART No.	VIKING PART No.	QUAM PART No.	
SP1A	PM	3.6Ω	180041 ②	6J4	6A15	② Used in table models
B	PM	3.6Ω	180050 ③	12J12	12A31	③ Used in console models
	CONE DIA.	V. C. DIA.				
SP2A	5 7/8"	9/16"				
B	11 7/8"	1"				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.240A	75Ω	1.5 Henries	737016	C-2326	C-2991 ①	TR-3300 ①①	Drill one new mounting hole.

COILS (RF-IF)

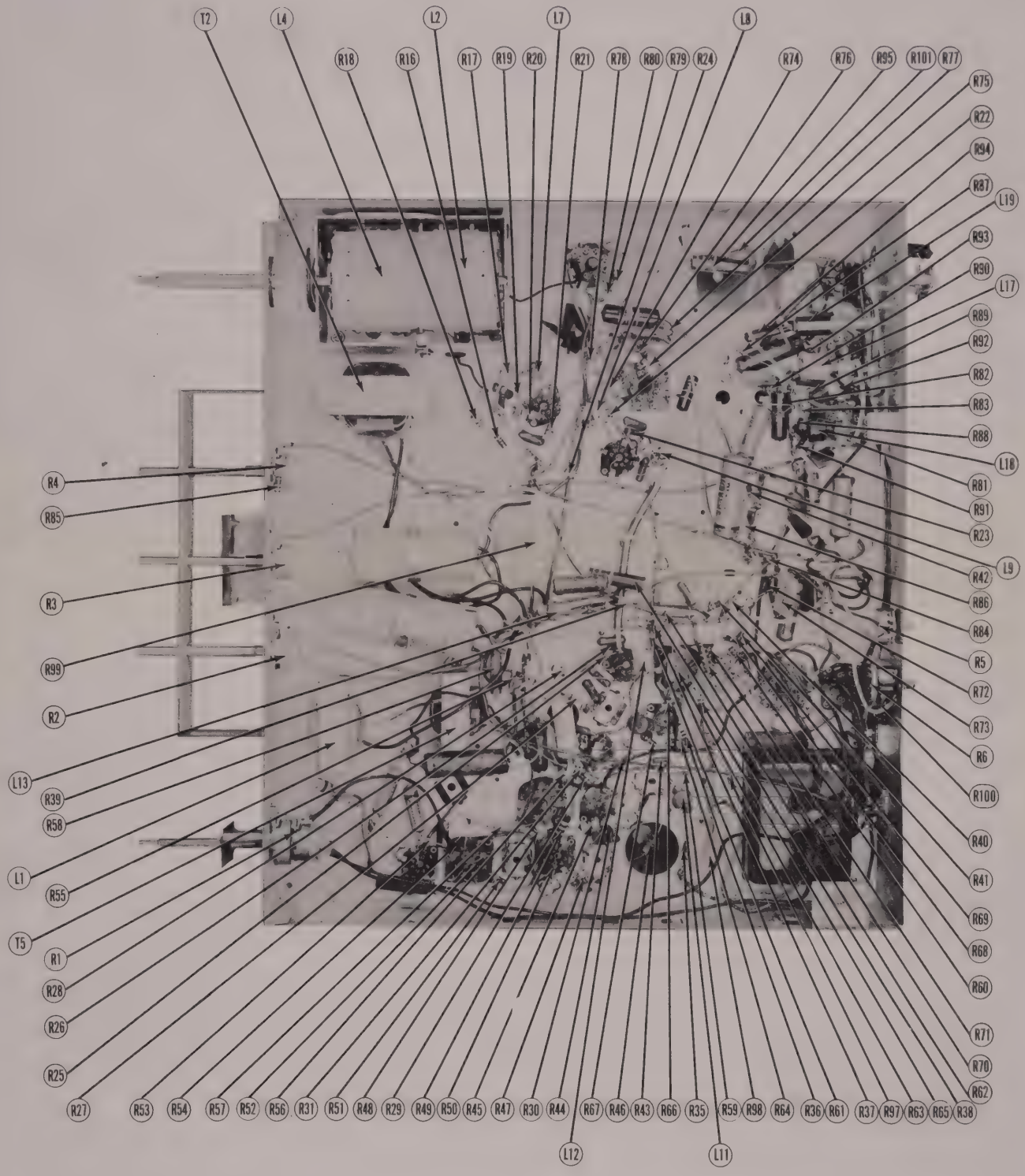
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	EMERSON PART No.		
L2	Ant. Coil	0Ω	0Ω			Part of Tuner Part # 470658
L3	Fil. Choke	0Ω				Part of Tuner Part # 470658
L4	RF, Mixer Grid and Osc. Coil	0Ω				Part of Tuner Part # 470658
L5	Fil. Choke	0Ω				Part of Tuner Part # 470658
L6	Conv. Plate Coil	.6Ω	.1Ω			Part of Tuner Part # 470658
L7	1st. Video IF	.1Ω	.5Ω	720131		
L8	2nd. Video IF	.3Ω	.3Ω	720137		Includes Trap
L9	3rd. Video IF	.3Ω	.3Ω	720133		Includes Trap
L10	4th. Video IF	1.3Ω	1.3Ω	720127		
L11	Peaking	20Ω		708115		660 Microhenries
L12	Peaking	14Ω		708099		330 Microhenries
L13	Peaking	20Ω		708115		660 Microhenries
L14	1st. Sound IF	6.8Ω	2.3Ω	720135		
L15	2nd. Sound IF	1.6Ω	1.6Ω	720081		
L16	Disc. Trans.	1.5Ω	1.5Ω	708018		Tap .7Ω
L17	Horiz. Osc.	120Ω	Tap 35Ω	716052		
L18	Horiz. Phase Coil	55Ω		738037		
L19	Horiz. Size	4.6Ω		708068		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			EMERSON PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG Pigtail	.250	808170		318.250		

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M2A	RF Tuner	470658	
B	RF Tuner	470673	(Alternate)
M3	Focus Magnet	470660	
M4	Ion Trap	708061	
	Knob	460233	Contrast
	Knob	450106	Off/On Volume
	Knob	450105	Channel Selector (Chassis 120143-B)
	Knob	460193	Channel Selector (Chassis 120143-H)
	Knob	460234	Fine Tuning
	Spring	542279	Compression for 460233
	Spring	542278	Compression for 460234



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

B. F. GOODRICH MODELS 92-523, 92-524, 92-525, 92-526, 92-527, 92-528

B. F. GOODRICH MODELS 92-523, 92-524, 92-525, 92-526, 92-527, 92-528

B. F. GOODRICH MODEL 92-523

TRADE NAME	B. F. Goodrich, Models 92-523, 92-524, 92-525, 92-526, 92-527, 92-528
SUPPLIER	B. F. Goodrich Co., Akron, Ohio
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 12BE6 Converter, 12BA6 IF Amp., 12AT6 Det.-AVC-AF, 50C5 Power Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .25 Amp. @ 117 volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial. Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator to B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1Mfd.	High side to stator on rear section of tuning gang. Low side to B-.	455KC (400 ∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune for maximum output.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

B. F. GOODRICH
MODEL 92-523

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA B. F. GOODRICH PART No.	REPLACEMENT DATA STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det. -AVC-AF	12AT6	12AT6	7BT	
V4	Power Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA B. F. GOODRICH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	50	150	23A691441	PRS150/50-30		BRD5315A		TVA-2450	Filter
B	30	150							Filter
C2	.05	200	8K691444	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C3A	220		♦21B482847	SI220	‡PC-150	5W5T25	GP2K-221	♦34C3	Diode RF Filter
B	.002			P688-002		PTE602	GP2-333-202		Audio Coupling
C	220			SI220		5W5T25	GP2K-221		AF Amp. Plate
D	.005			P688-005		PTE6D5	GP2-333-502		Audio Coupling
C4	.02	400	8A691442	P488-02	DF-203	PTE4S2		4TM-S2	Audio Output Plate
C5	.05	400	8K691443	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter
C6	.15	400	8A691842						Line Isolation †

♦ Items C3A, C3B, C3C, C3D are combined into one unit.
† Special capacitor resonate at 455KC.
‡ This item will replace C3A, C3B, C3C, C3D, R5, R6, and R7.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA B. F. Goodrich PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg	½	18A691440	Q13-137	AG-63-Z	BSK-70-S	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A Per Instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A Per Instructions

RESISTORS

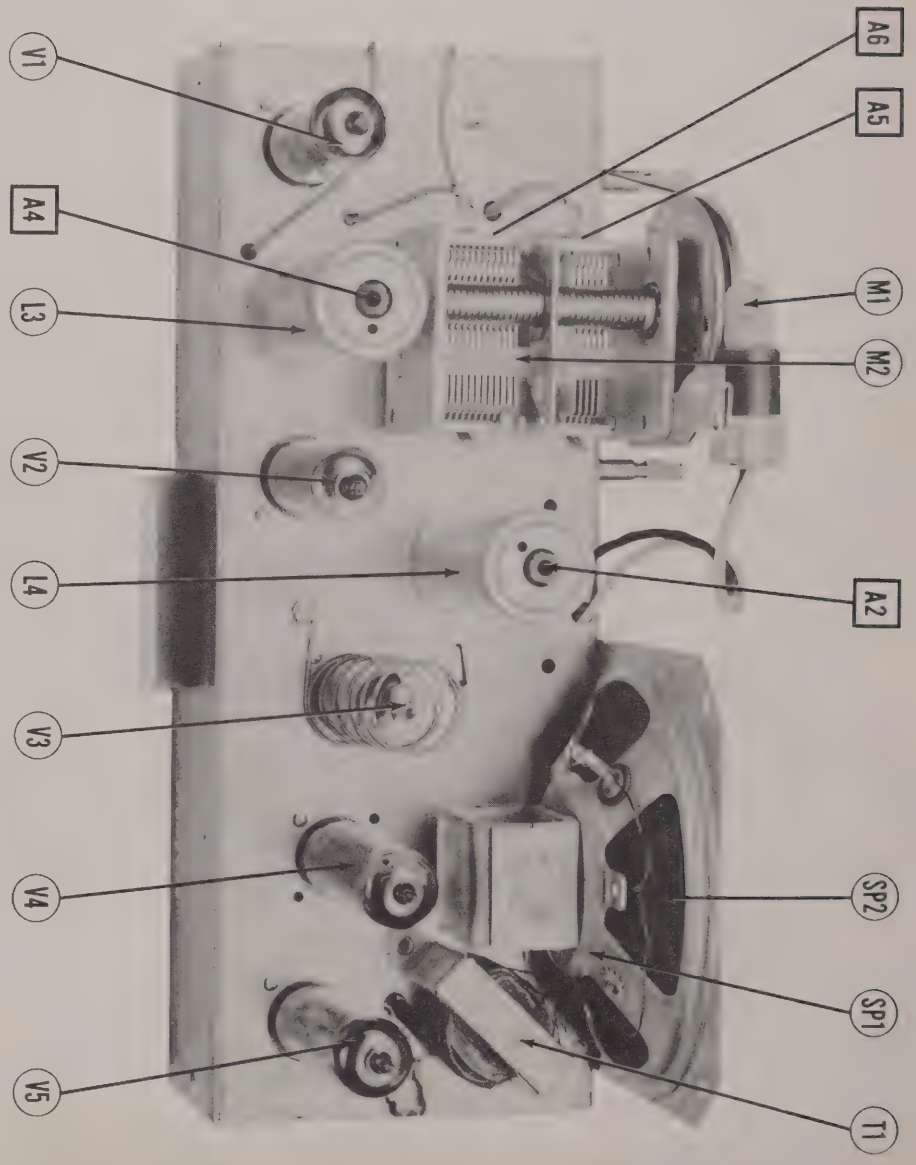
ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA B. F. GOODRICH PART No.	IRC PART No.	IDENTIFICATION CODES
R2	22KΩ	½	6R6028	BTS-22K	Osc. Grid
R3	100Ω	½	6R6018	BTS-100	IF Amp. Cathode
R4	2.2 Meg	½	6R2118	BTS-2.2Meg	AVC Network-See Note 1
R5	6.8Meg	½	6R2109	BTS-6.8Meg	AF Amp. Grid-See Note 2
R6	470KΩ	½	6R6032	BTS-470K	AF Plate
R7	470KΩ	½	6R6032	BTS-470K	Output Grid
R8	150Ω	½	6R3992	BTS-150	Output Cathode
R9	1000Ω	1	6R3953	BTA-1000	Filter
R10	25Ω	½	6R5683		Surge Limiter

Note 1 Some models use 3.3 Meg in this application.
Note 2 Some models use 10Meg in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA B. F. Goodrich PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	2.2KΩ	3.2Ω	170Ω	.4Ω	25K485973	A-3332	A-3025	RO-2 ①	Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA B. F. GOODRICH PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD RES.	V. C. DIA.	50K691765 or	ST113		
SP1	PM	3.2Ω	50C478138	Mod. P4-X	4A07	
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

R F COILS

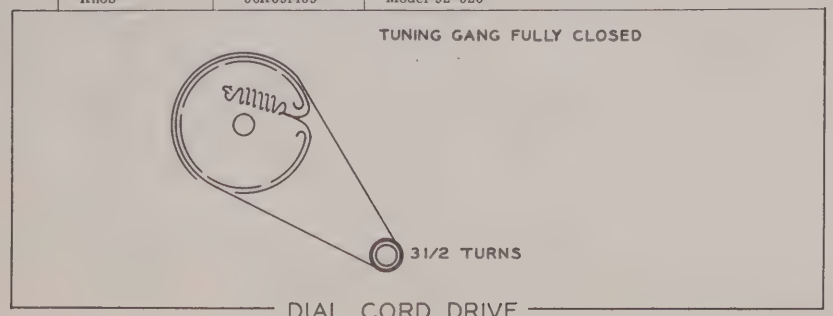
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA B. F. Goodrich PART No.		
L1	Loop Ant.	4Ω		24K691446		
L2	Osc. Coil	1Ω	13Ω	24K690762		
L3	1st IF	14Ω	14Ω	24B482863		
L4	2nd IF	14Ω	14Ω	24B482865		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA B. F. GOODRICH PART No.		NOTES
M1	Bayonet	6-8	.15	Brown	65X11854		Type number 47.

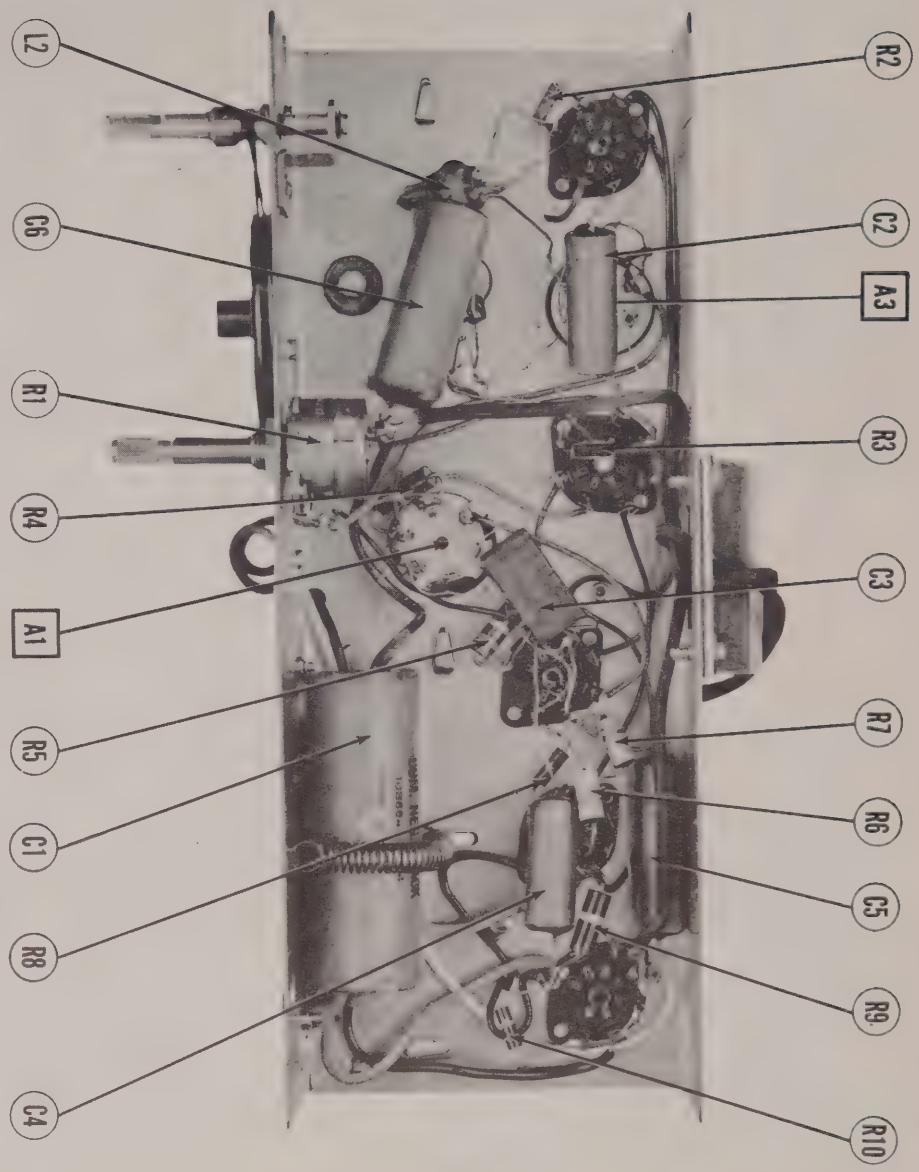
MISCELLANEOUS

ITEM No.	PART NAME	B. F. GOODRICH PART No.	NOTES
M2	2 Gang Var. Cap.	1X485960	23-385MMF, 16-105MMF
	Dial Scale	34C690441	
	Cabinet	16E690434	Model 92-523
	Cabinet	16K690438	Model 92-524
	Cabinet	16K690436	Model 92-525
	Cabinet	16K691447	Model 92-526
	Knob	36B690442	Model 92-523
	Knob	36K690444	Model 92-524
	Knob	36K691460	Model 92-525
	Knob	36K691459	Model 92-526



DIAL CORD DRIVE

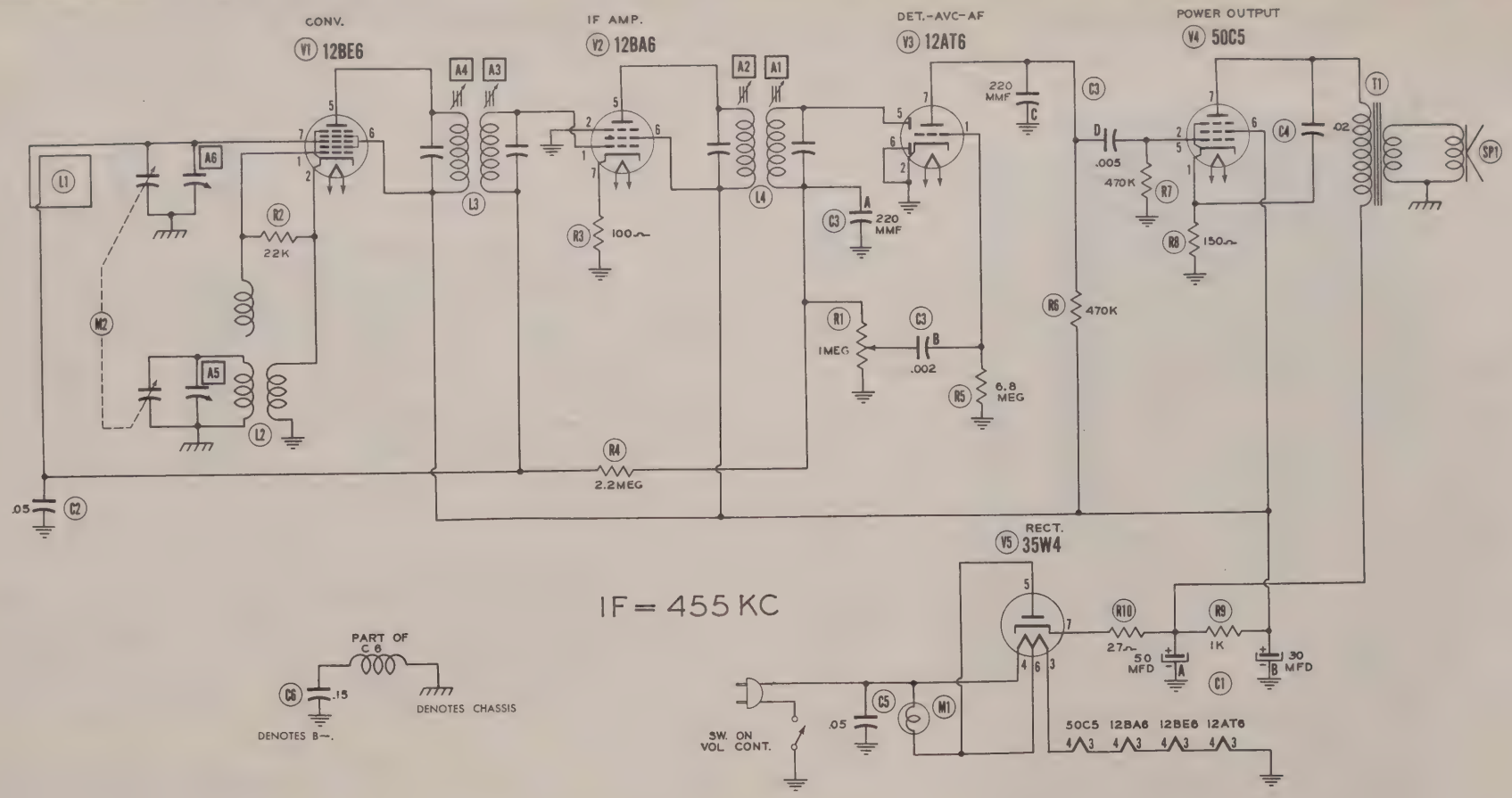
CHASSIS—BOTTOM VIEW



SET 148 FOLDER 7

B. F. GOODRICH MODEL 92-523

B. F. GOODRICH MODEL 92-523



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	§-7.8VDC	0V	12VAC	24VAC	90VDC	90VDC	-.1VDC
V 2	12BA6	-.1VDC	0V	24VAC	36VAC	90VDC	90VDC	1.3VDC
V 3	12AT6	-.5VDC	0V	0V	12VAC	-.4VDC	0V	35VDC
V 4	50C5	6.7VDC	0V	36VAC	85VAC	0V	90VDC	105VDC
V 5	35W4	110VDC	0V	85VAC	117VAC	110VAC	110VAC	110VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	1Ω	12Ω	24Ω	†1KΩ	†1KΩ	3.2Meg
V 2	12BA6	3.2Meg	0Ω	24Ω	36Ω	†1KΩ	†1KΩ	100Ω
V 3	12AT6	6.8Meg	0Ω	0Ω	12Ω	1Meg	0Ω	†470KΩ
V 4	50C5	150Ω	470KΩ	36Ω	86Ω	470KΩ	†1KΩ	†200Ω
V 5	35W4	†27Ω	Inf.	86Ω	120Ω	110Ω	110Ω	100KΩ

† MEASURED FROM PIN 7 OF V5.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

MAGNAVOX CHASSIS CT-270, CT-271, CT-272, CT-273, CT-274, CT-275, CT-276, CT-277, CT-278, CT-279, CT-280, CT-281, CT-282

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CHASSIS CT-277

MAGNAVOX CHASSIS CT-270, CT-271, CT-272, CT-273, CT-274, CT-275, CT-276, CT-277, CT-278, CT-279, CT-280, CT-281, CT-282

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DATE 10-51 SET 148 FOLDER 8

PHOTOFACT* Folder

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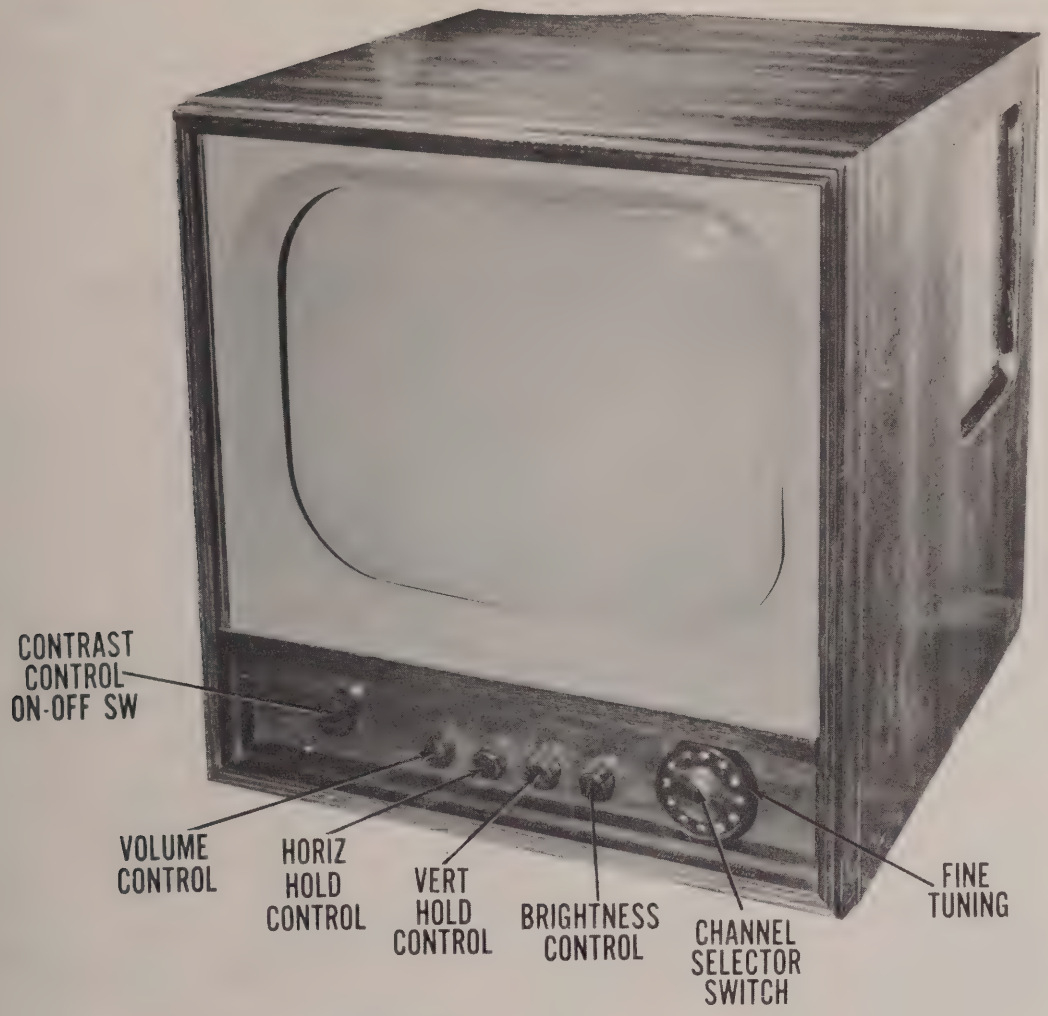
MAGNAVOX CHASSIS CT-270, CT-271, CT-272, CT-273, CT-274, CT-275, CT-276, CT-277, CT-278, CT-279, CT-280, CT-281, CT-282



MAGNAVOX CHASSIS CT-277

TRADE NAME	Magnavox, Chassis CT-270, CT-271, CT-272, CT-273, CT-274, CT-275, CT-276, CT-277, CT-278, CT-279, CT-280, CT-281, CT-282.
MANUFACTURER	Magnavox Co., Fort Wayne, Indiana
TYPE SET	Television only (Chassis CT-271, CT-273, CT-275, CT-278, CT-281 are used with radio chassis)
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 1.7 Amp. at 117 Volts AC
TUNING RANGE—CHANNELS	2 thru 13

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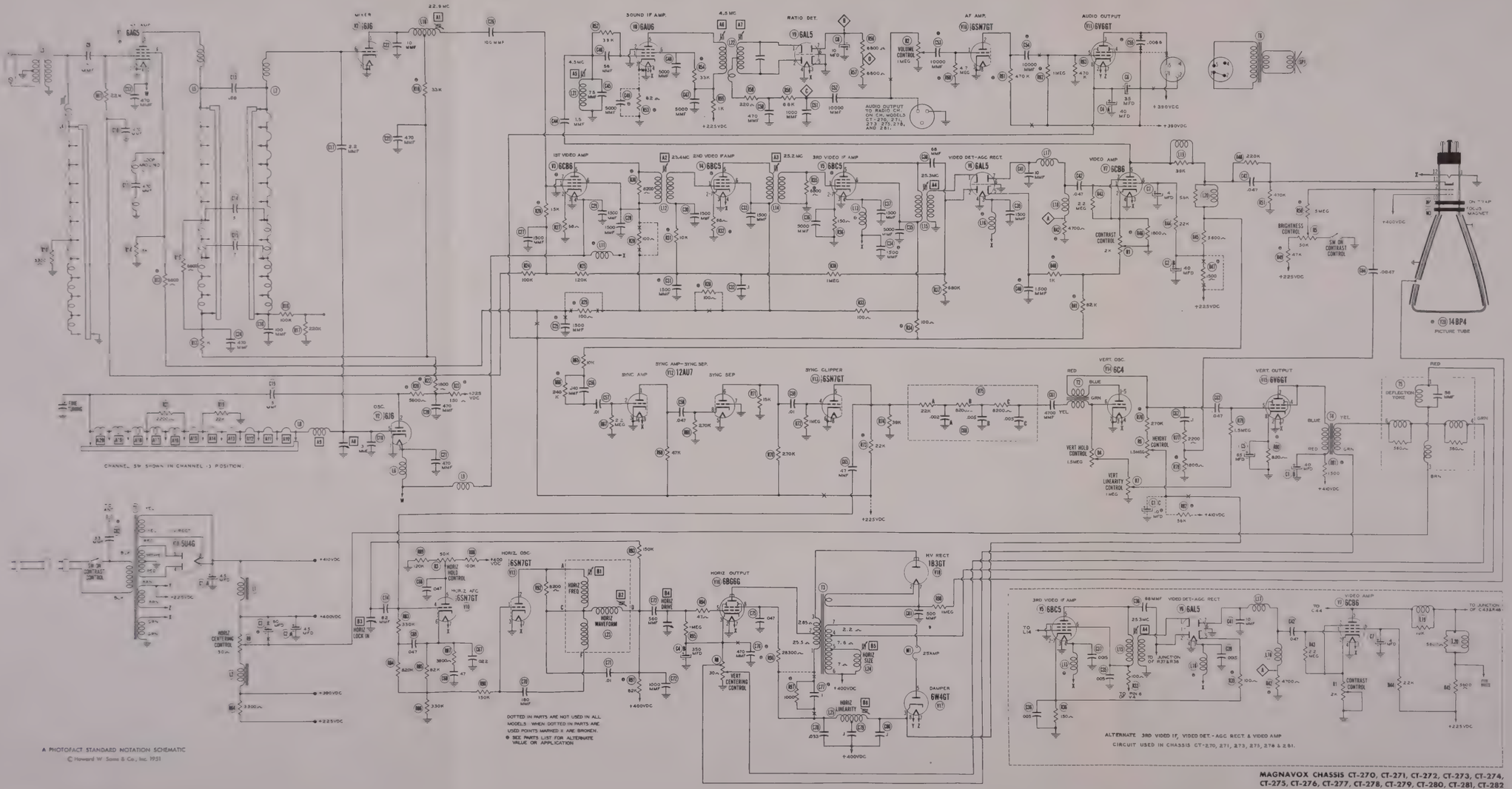

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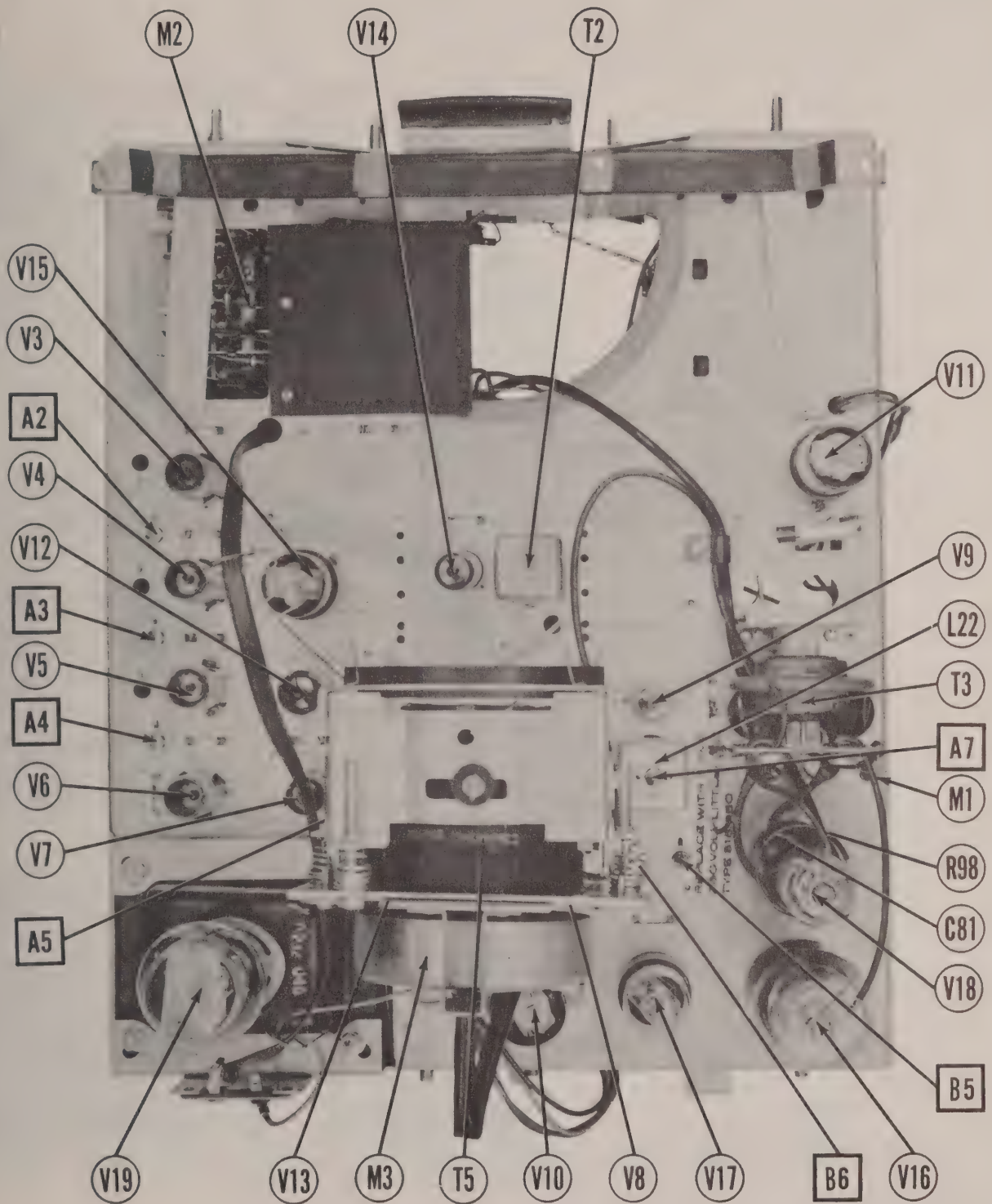
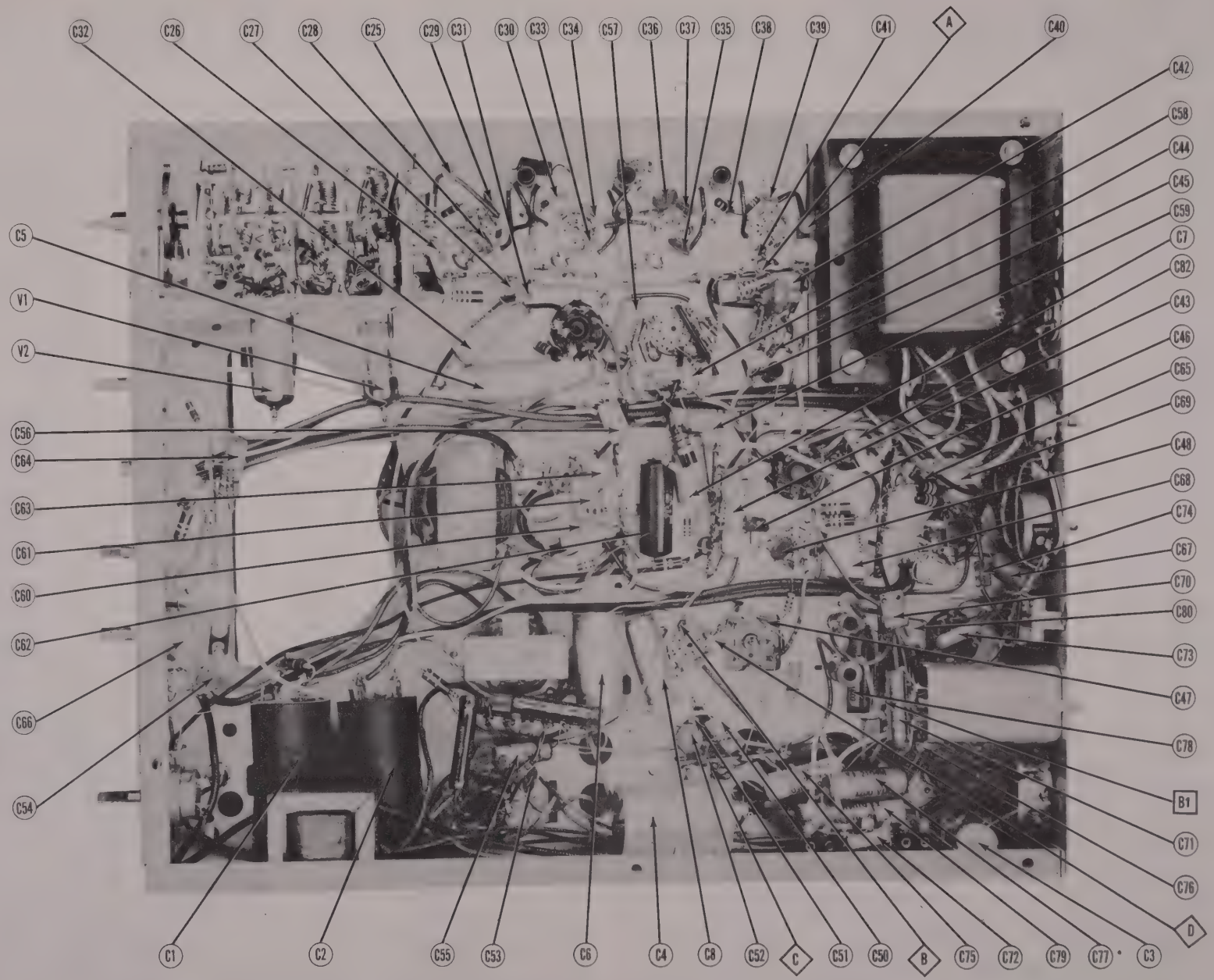
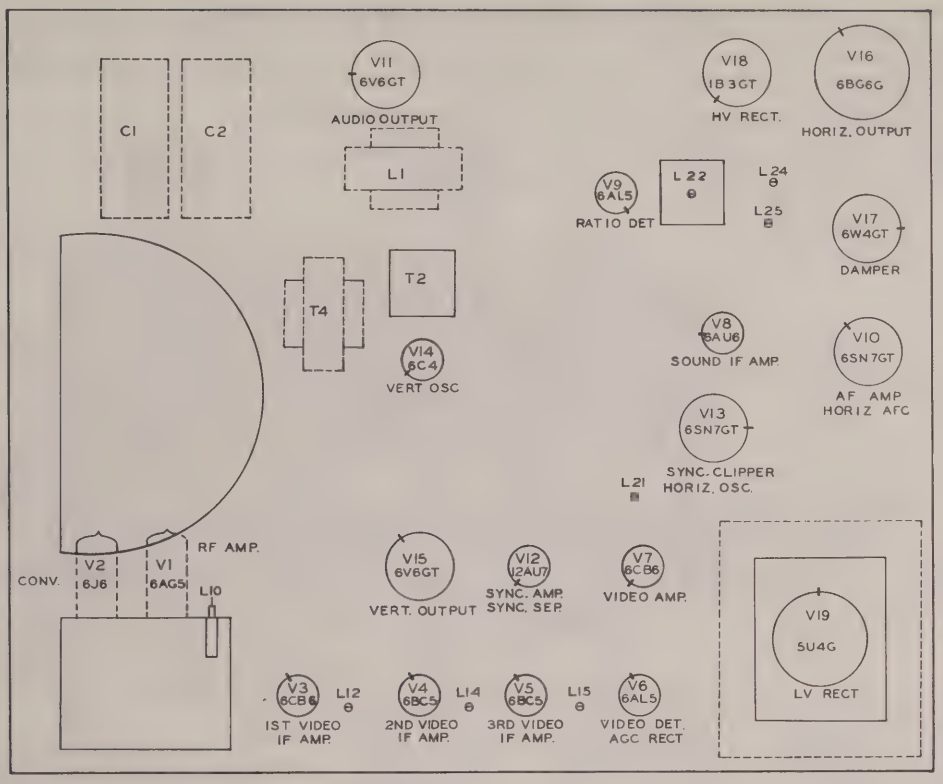
MAGNAVOX CHASSIS CT-270, CT-271, CT-272, CT-273, CT-274, CT-275, CT-276, CT-277, CT-278, CT-279, CT-280, CT-281, CT-282



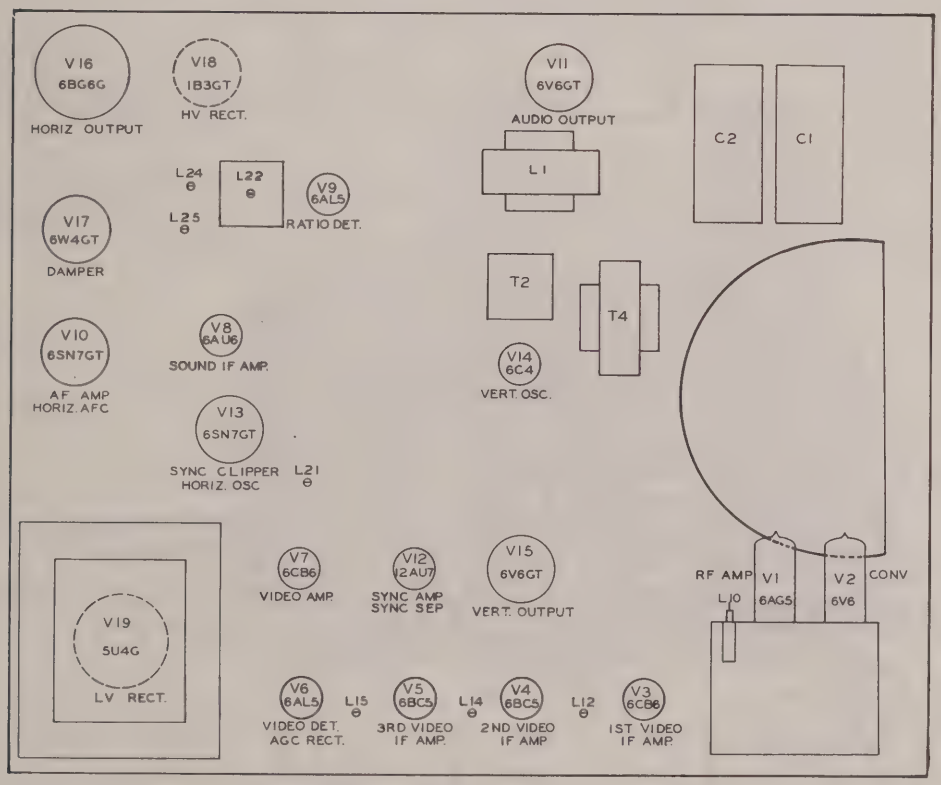
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator to disable the high voltage

VIDEO IF ALIGNMENT

Remove the converter tube, (V2), and replace it with a 6J6 which has pin 2 removed. This will disable the local oscillator and prevent the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded lead of C32. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	22.9MC (unmod.)	Any	DC Probe to Point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	23.4MC	"	"	A2	"
3.	"	"	25.2MC	"	"	A3	"
4.	"	"	25.3MC	"	"	A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	24MC (10MC SWP)	22.75MC 25.75MC	Any	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to fig. 1. If necessary retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD.	High side to pin 1 (Grid), of 6CB46, (V7). Low side to chassis.	4.5MC (unmod.)	Any	DC Probe to Point (B). Common to chassis.	A5, A6	Adjust for maximum deflection.
7.	"	"	"	"	DC Probe to Point (C). Common to Point (D).	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD.	High side to pin 1, (Grid) of 6CB6, (V7). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. to Point (B). Low side to chassis.	A5, A6	Disconnect stabilizer capacitor C8. Adjust for maximum amplitude and symmetry as per fig. 2.
7.	"	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A7	Reconnect capacitor C8. Adjust A7 so 4.5MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect an unmodulated signal generator to an ungrounded tube shield floating over the first video IF tube, (V3).
Set the generator frequency to 25.75MC. This marker is used as a video IF referance.
Complete oscillator alignment may not be necessary.
If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A8.
It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A8 will not bring all channels well within the range of the fine tuning control, it will be necessary to adjust the oscillator coil for each channel that is off frequency. The high channel oscillator coils are adjusted by moving the loops up or down, and the low channel coils are adjusted by expanding or compressing the coil turns.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC	13	Vert. Amp. to Point (A). Low side to chassis.	A9	Adjust coil, until markers coincide on response curve.
			207MC (10MC SWP)	205.25MC	12		A10	
			201MC (10MC SWP)	199.25MC	11		A11	
			195MC (10MC SWP)	193.25MC	10		A12	
			189MC (10MC SWP)	187.25MC	9		A13	
			183MC (10MC SWP)	181.25MC	8		A14	
			177MC (10MC SWP)	175.25MC	7		A15	
			85MC (10MC SWP)	83.25MC	6		A16	
			79MC (10MC SWP)	77.25MC	5		A17	
			69MC (10MC SWP)	67.25MC	4		A18	
			63MC (10MC SWP)	61.25MC	3		A19	
			57MC (10MC SWP)	55.25MC	2		A20	

THE RF AND MIXER PORTION OF THIS RECEIVER HAS BEEN PROPERLY ALIGNED AT THE FACTORY AND IS VERY STABLE. ALIGNMENT OF THIS PORTION SHOULD NOT BE REQUIRED IN THE FIELD.

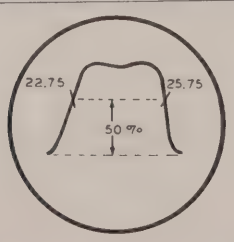


FIG. 1

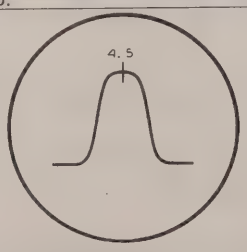


FIG. 2

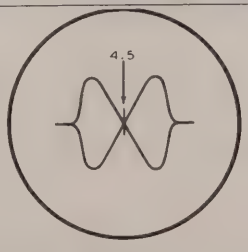
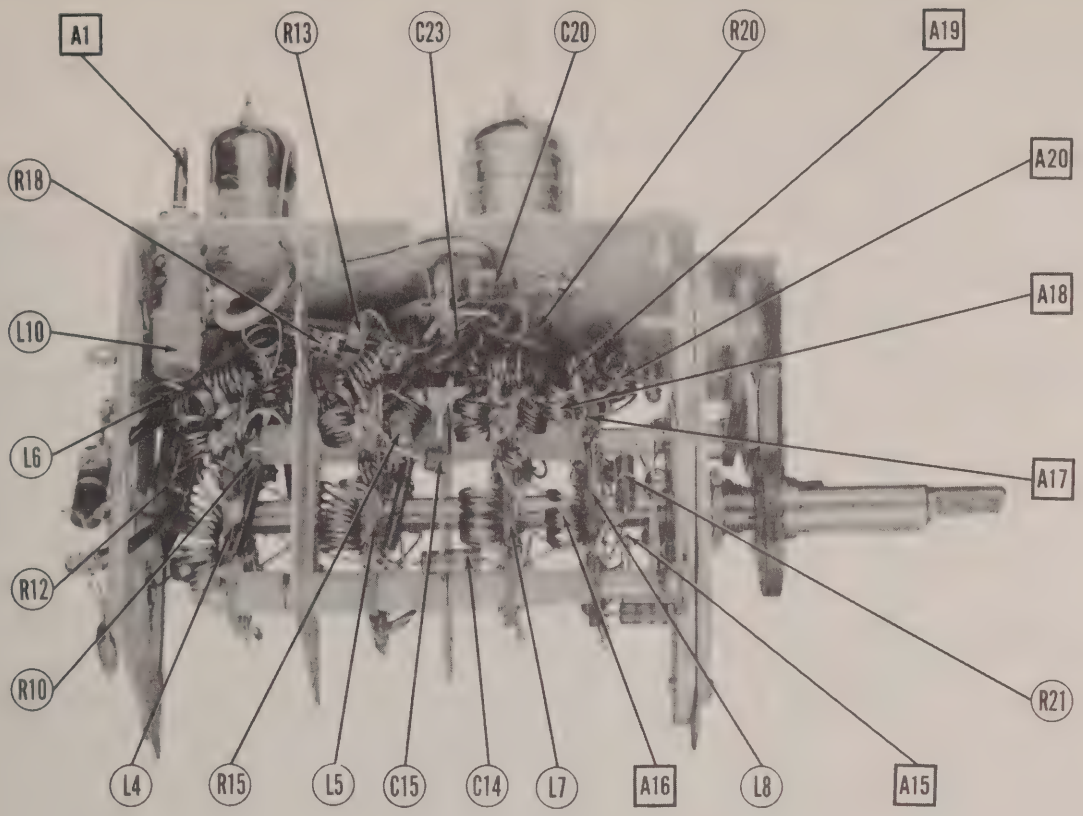
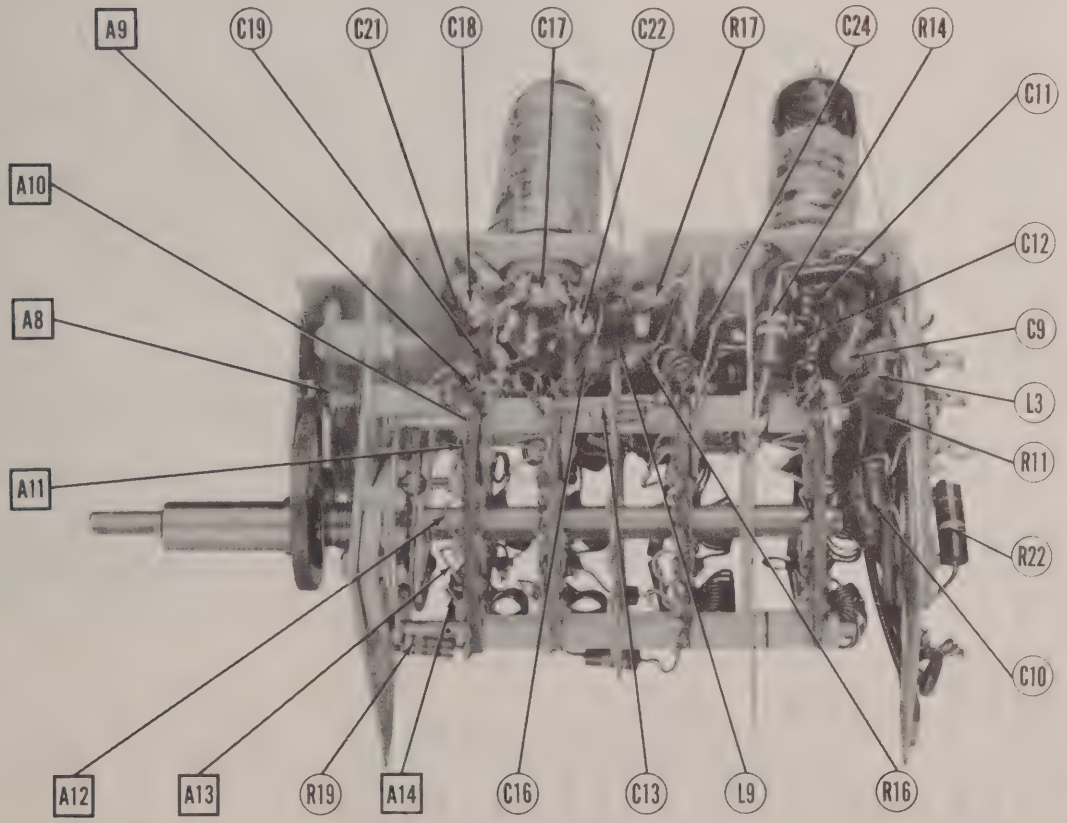


FIG. 3



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-2.7VDC	0V	6.2VAC	0V	200VDC	85VDC	0V		
V 2	6J6	80VDC	125VDC	6.1VAC	0V	§-3.3VDC	-1.3VDC	0V		
V 3	6CB6	-.3VDC	.6VDC	0V	6.3VAC	120VDC	120VDC	0V		
V 4	6BC5	-.2VDC	.4VDC	0V	6.2VAC	125VDC	125VDC	.4VDC		
V 5	6BC5	0V	1.5VDC	0V	6.2VAC	120VDC	120VDC	1.5VDC		
V 6	6AL5	0V	-3.6VDC	6.2VAC	0V	0V	0V	-.4VDC		
V 7	6CB6	.5VDC	17VDC	6.3VAC	0V	130VDC	110VDC	17VDC		
V 8	6AU6	-1.2VDC	0V	0V	6.3VAC	210VDC	110VDC	0V		
V 9	6AL5	-.3VDC	-.3VDC	6.3VAC	0V	0V	0V	-.4VDC		
V 10	6SN7GT	-.6VDC	21VDC	0V	-2.4VDC	160VDC 230VDC	-7.5VDC	6.3VAC	0V	
V 11	6V6GT	0V	¶0V	▲225VDC	▲245VDC	▲-15VDC	390VDC	¶6.3VAC	▲0V	
V 12	12AU7	39VDC	-2.8VDC	0V	0V	0V	6.3VDC	0V	1.6VDC	6.3VDC
V 13	6SN7GT	§-90VDC §-99VDC	225VDC	0V	§-.6VDC	46VDC	0V	6.3VAC	0V	
V 14	6C4	220VDC 480VDC	0V	0V	6.3VAC	220VDC 480VDC	§-40VDC §-80VDC	0V		
V 15	6V6GT	0V	0V	380VDC	380VDC	-3.3VDC	0V	6.3VAC	9.8VDC	
V 16	6BG6G	0V	0V	2.7VDC	0V	-21VDC	-21VDC	6.3VAC	290VDC	Top Cap *
V 17	6W4GT	0V	0V	590VDC	0V	400VDC	0V	¶6.3VAC	¶0V	
V 18	1B3GT	* DO NOT MEASURE								Top Cap *
V 19	5U4G	0V	410VDC	0V	370VAC	0V	370VAC	0V	410VDC	
V 20	14BP4	0V	0V 50VDC	PIN 10 400VDC	PIN 11 95VDC	PIN 12 6.3VAC	H. V. CONNECTOR ** 10750V			

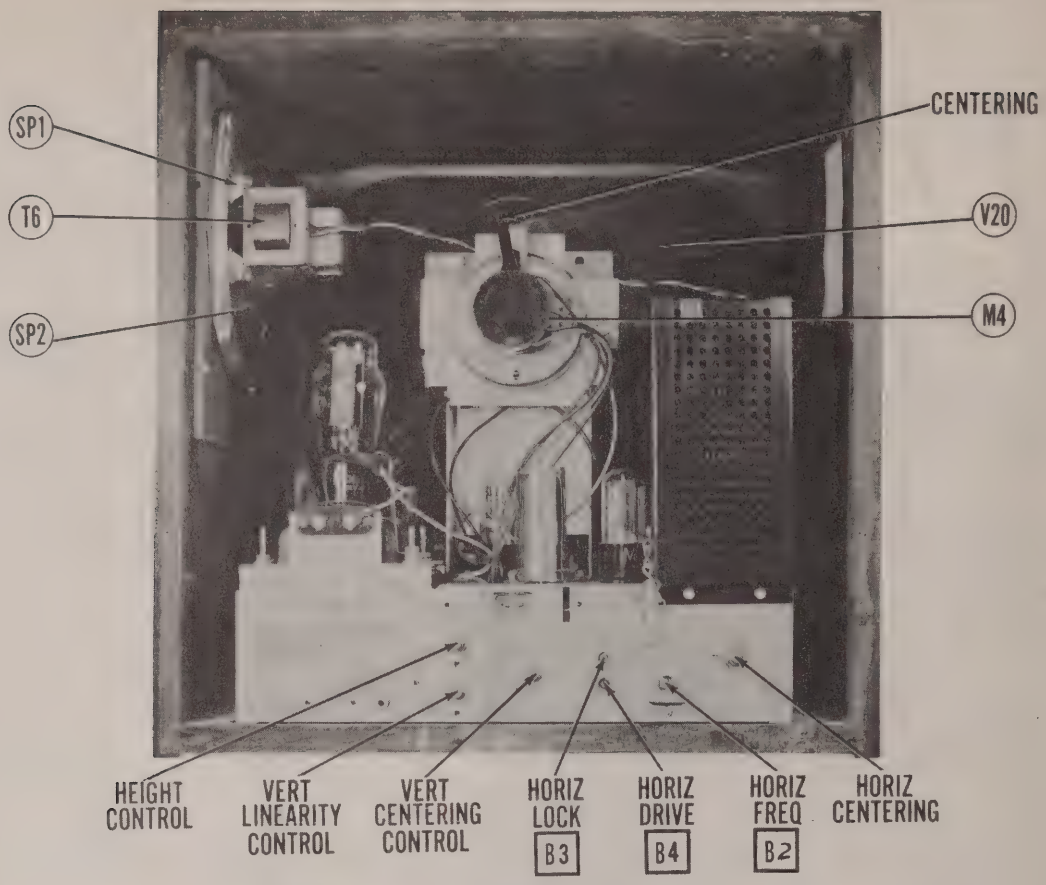
ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
¶ MEASURED FROM 225VDC LINE
* DO NOT MEASURE
§ TAKEN WITH VACUUM TUBE VOLTMETER
** USE EXTREME CAUTION WHEN MEASURING THIS VOLTAGE
▲ MEASURED FROM PIN 8 OF V11

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	1.9Meg	0Ω	.4Ω	0Ω	†6.3KΩ	▲5.5KΩ	0Ω		
V 2	6J6	†38KΩ	†9KΩ	.2Ω	0Ω	22KΩ	320KΩ	0Ω		
V 3	6CB6	1.8Meg	68Ω	0Ω	.1Ω	▲200Ω	▲200Ω	0Ω		
V 4	6BC5	1.6Meg	68Ω	0Ω	.1Ω	▲100Ω	▲100Ω	68Ω		
V 5	6BC5	.5Ω	150Ω	0Ω	.3Ω	▲200Ω	▲200Ω	150Ω		
V 6	6AL5	.5Ω	680KΩ	.2Ω	0Ω	1KΩ	0Ω	4.7KΩ		
V 7	6CB6	2.2Meg	1KΩ	.1Ω	0Ω	†10.5KΩ	†27KΩ	1KΩ		
V 8	6AU6	39KΩ	0Ω	0Ω	.1Ω	†4.4KΩ	†37KΩ	0Ω		
V 9	6AL5	Inf.	Inf.	.1Ω	0Ω	0Ω	0Ω	13KΩ		
V 10	6SN7GT	4.7Meg	†470KΩ	0Ω	1.4Meg	†80KΩ †70KΩ	415KΩ	.1Ω	0Ω	
V 11	6V6GT	0Ω	¶0Ω	†650Ω	†110Ω	360KΩ	†85Ω	¶.1Ω	25KΩ	
V 12	12AU7	▲47KΩ	2.2Meg	0Ω	0Ω	0Ω	▲25KΩ	0Ω	270KΩ	.1Ω
V 13	6SN7GT	510KΩ	†82KΩ	0Ω	1Meg	▲15KΩ	0Ω	.1Ω	0Ω	
V 14	6C4	#1.7Meg #270KΩ	0Ω	0Ω	.1Ω	#1.7Meg #270KΩ	2.5Meg 1Meg	0Ω		
V 15	6V6GT	0Ω	0Ω	†2.3KΩ	†2.3KΩ	2.5Meg 1.5Meg	Inf.	.1Ω	820Ω	
V 16	6BG6G	Inf.	0Ω	27Ω	Inf.	1Meg	1Meg	.1Ω	#28KΩ	Top Cap #1KΩ
V 17	6W4GT	Inf.	Inf.	Inf.	Inf.	†65Ω	Inf.	¶.1Ω	¶0Ω	
V 18	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								Top Cap #1.3KΩ
V 19	5U4G	Inf.	60KΩ	Inf.	20Ω	Inf.	23Ω	Inf.	60KΩ	
V 20	14BP4	0Ω	†1.6Meg †160KΩ	PIN 10 †55Ω	PIN 11 †160KΩ	PIN 12 .1Ω				

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
† MEASURED FROM PIN 2 OF V19
# MEASURED FROM PIN 3 OF V17
¶ MEASURED FROM 225VDC LINE
▲ MEASURED FROM PIN 8 OF V11

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station preferably a test pattern.

Turn the horizontal lock trimmer, (B3), trimmer, (B3), three turns counter-clockwise from tight.

Connect a short across terminals C and D of L23.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug, (B1), until the picture synchronizes horizontally.

Remove the short from L23 and check to see if the picture will pull into synchronization, after interruption of the signal, at each end of the hold control range. If necessary adjust the horizontal phasing slug (B2), until the picture pulls in at both ends of the hold control range. If the above condition cannot be obtained by adjusting B2, adjust B2 until the picture is synchronized and proceed with the remainder of horizontal sweep circuit adjustments, and then come back and repeat entire oscillator alignment.

Adjust the horizontal drive trimmer, (B4), counter-clockwise as far as possible without crowding the left center of the picture.

Adjust the horizontal size slug, (B5), until the picture is slightly wider than necessary to fill the mask horizontally.

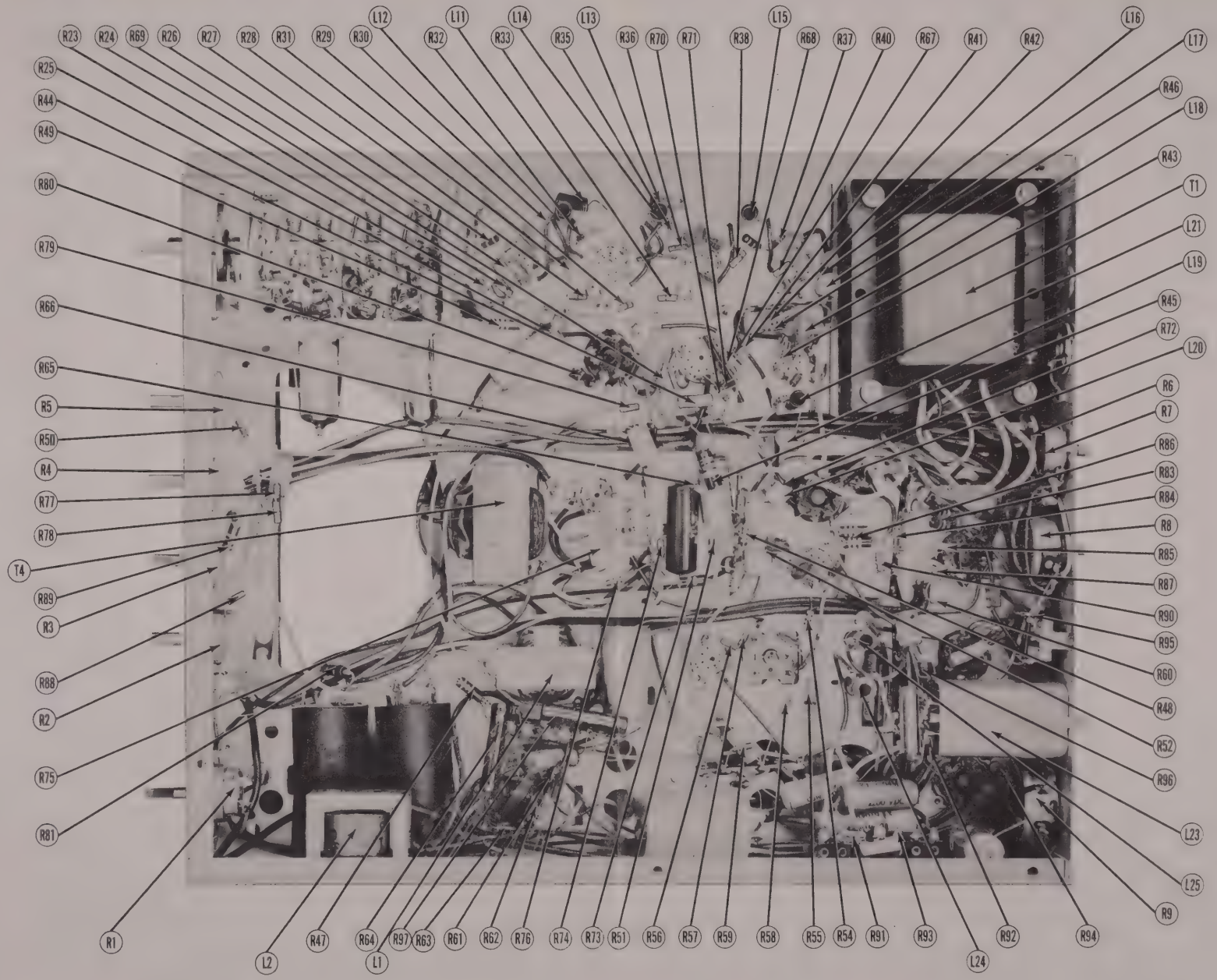
Adjust the horizontal linearity slug, (B6), until the picture is symmetrical from left to right.

Since both width and horizontal linearity are affected by the drive trimmer, it may be necessary to adjust them alternately for optimum results.

DISASSEMBLY INSTRUCTIONS

1. Remove seven push-on type control knobs.
2. Remove nine wood screws from rear cover. Remove rear cover.
3. Disconnect speaker.
4. Remove six 1/4" X 20 PK bolts from chassis. Remove chassis.
5. Remove three 11/32" hex nuts from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No	USE	REPLACEMENT DATA: MAGNAVOX Part No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6AG5	6AG5	7BD	
B	RF Amplifier	6BC5	6BC5	7BD	
V2	Converter	6J8	6J8	7BF	
V3A	1st. Video IF Amp.	6CB6	6CB6	7CM	
B	1st. Video IF Amp.	6AU6	6AU6	7BK	
V4A	2nd. Video IF Amp.	6BC5	6BC5	7BD	
B	2nd. Video IF Amp.	6AG5	6AG5	7BD	
C	2nd Video IF Amp.	6AU6	6AU6	7BK	
V5A	3rd Video IF Amp.	6BC5	6BC5	7BD	
B	3rd Video IF Amp.	6AG5	6AG5	7BD	
C	3rd. Video IF Amp.	6AU6	6AU6	7BK	
V6	Video Detector-AGC Rectifier	6AL5	6AL5	6BT	
V7	Video Amplifier	6CB6	6CB6	7CM	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Detector	6AL5	6AL5	6BT	
V10	AF Amplifier - Horiz. AFC	6SN7GTA	6SN7GTA	8BD	Some models use V10 for Horiz. AFC only.
V11	Audio Output	6V6GT	6V6GT	7AC	
V12	Sync. Amplifier - Sync. Separator	12AU7	12AU7	9A	
V13	Sync. Clipper-Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V14	Vert. Oscillator	6C4	6C4	5BG	
V15	Vert. Output	6V6GT	6V6GT	7AC	
V16	Horiz. Output	6BG6G	6BG6G	5BT	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V19	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: MAGNAVOX PART No.	SYLVANIA PART No.	THOMAS PART No.	RMA BASE TYPE	NOTES
2BP4	14BP4	14BP4	14CP4 ②	12D	② Use single magnet ion trap.
B	14CP4	14CP4	14CP4	12D	③ Ground outer coating
C	16KP4	16KP4	16KP4	12D	④ Space permitting
D	16RP4	16RP4	16KP4	12D	
E	16XP4	16KP4 ② ③	16KP4 ② ③	12D	
F	16GP4	16GP4		12D	
G	16TP4	16TP4	16KP4 ④	12D	
H	17AP4	17BP4A ④	17BP4 ④	12D	
I	17BP4	17BP4A ②	17BP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MAGNAVOX PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	45	475	270021-39 †	AFH2-72		UPT4450		TVL-2830	▲ Filter
B	40	475							▲ Vert. Output Dec.
C	10	475							Vert. Osc. Decoupling •
C2A	45	475	270021-39	AFH2-72		UPT4450		TVL-2830	▲ Filter
B	40	475							▲ Decoupling
C3	80	25	270027-18	PRS25/100		BRH251A		TVA-1207	Horiz. Cent. Cont. Bypass •
C4A	40	250	270027-15	AFH4-73				R1156	▲ Decoupling
B	350	15							▲ Horiz. Output Cathode
C5	65	50	270027-17	PRS50/100		BRH501		TVA-1310	Vert. Output Cathode
C6	35	300	270027-16	PRS450/40		BR3035		TVA-1610	audio Output Dec.
C7	4	400	270027-14	PRS450/4		BR445		TVA-1702	Video Amp. Screen
C8	10	50	270027-4	PRS50/10		BR105		TVA-1304	Stabilizing Cap.
C9	15		250176-4	SII5	D6-150		GP1K-150	5GA-Q15	RF Coupling
C10	470		250176-18	SI470	D6-471		GP2K-471	5GA-T47	AGC Filter
C11	470		250176-18	SI470	D6-471		GP2K-471	5GA-T47	RF Amp. Screen
C12	470		250176-18	SI470	D6-471		GP2K-471	5GA-T47	RF Amp. Fil.
C13	.68		250184-7		TCZ-.68		NP0K-R680		RF Coupling
C14	.5		250184-6		TCZ-.5		NP0K-R50		RF Coupling
C15	1.5		250164-8	SII.5NP0	TCZ-1.5		NP0K-1R5		RF Coupling
C16	100		250176-6	SI100	D6-101		GP1K-101	5GA-T1	Mixer Grid Filter
C17	2.2		250164-13		TCZ-2.2		NP0K-2R2		Osc. Coupling
C18	3		250088-57				N330-331-150		Osc. Feedback
C19	15		250176-4	SII5	D6-150		GP1K-150	5GA-Q15	Osc. Feedback
C20	470		250176-18	DI470	D6-471		GP2K-471	5GA-T47	RF Bypass
C21	470		250176-18	SI470	D6-471		GP2K-471	5GA-T47	Conv. Fil.
C22	10		250176-12	SI10	D6-100		GP1K-100	5GA-Q1	Fixed Trimmer
C23	470		250176-18	SI470	D6-471		GP2K-471	5GA-T47	RF Bypass
C24	470		250176-18	SI470	D6-471		GP2K-471	5GA-T47	RF Bypass
C25	1500		250175-3	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	RF Bypass •
C26	100	mfd	250159-82	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	IF Coupling •
C27	1500		250175-3	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	AGC Filter
C28	1500		250175-3	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	1st. Video IF Dec.
C29	1500		250175-3	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	1st. Video IF Fil.
C30	1500		250175-3	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	AGC Filter
C31	1500		250175-3	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	AGC Filter •
C32	.1	200	250205-13	P288-1	DF-104	PTE4P1		2TM-P1	AGC Filter
C33	1500		250175-3	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	2nd. Video IF Dec.
C34	1500		250175-3	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	2nd. Video IF Fil. •
C35	5000		250175-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	3rd. Video IF Dec.
C36	5000		250175-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	3rd. Video IF Cathode
C37	1500		250175-3	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	3rd. Video IF Fil.
C38	68		250207-13	SI68	D6-680	5W5Q7	GP1K-680	5GA-Q68	IF Coupling
C39	1500		250175-3	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	Video Det. Fil.
C40	1500		250175-3	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	RF Bypass •
C41	10		250207-3	SII0	D6-100	5W5Q1	GP1K-100	5GA-Q1	Video Det. Filter
C42	.047	200	250205-11	P288-047	DF-503	PTE485		2TM-S47	Video Coupling
C43	.047	600	250203-11	P688-047	DF-503	PTE685		6TM-S47	Video Coupling
C44	1.5		250164-10	SII.5NP0	TCZ-1.5		NP0K-1R5		Sound IF Coupling
C45	75	500	250187-19	1469-000075	TCZ-75		NP0-333-750		Fixed Trimmer
C46	56	500	250187-50					MS-46	Sound IF Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MAGNAVOX PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C47	5000		250175-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Sound IF Plate
C48	5000		250175-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Sound IF Screen
C49	5000		250175-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Sound IF Cathode •
C50	470	500	250159-90	1468-0005	D6-471	5W5T25	GP2K-471	1FM-35	RF Bypass
C51	10000		250175-2	BPD-01	DD-103	1D3S1	821-01	5HK-S1	De-emphasis
C52	10000		250175-2	BPD-01	DD-103	1D3S1	821-01	5HK-S1	Audio Coupling
C53	10000		250175-2	BPD-01	DD-103	1D3S1	821-01	5HK-S1	Audio Coupling •
C54	10000		250175-2	BPD-01	DD-103	1D3S1	821-01	5HK-S1	Audio Coupling •
C55	.0068	500	250203-6	P688-0068	D6-682		GP2-333-682	6TM-D68	Audio Output Plate •
C56	240	500	250159-56	1469-00025		5R5T25			Sync. Coupling
C57	.01	600	250203-7	P688-01	D6-103	PTE6S1	GP2-332-103	6TM-S1	Sync. Coupling
C58	.047	600	250203-11	P688-047	DF-503	PTE6S5		6TM-S47	Sync. Coupling
C59	.01	600	250203-7	P688-01	D6-103	PTE6S1	GP2-332-103	6TM-S1	Sync. Coupling
C60A	.002	·	{	P688-002	{	PTE6D2	GP2-333-202	·	{ Vert. Integrator Net.
B	.005	·	#250186-1	P688-005	#PC-100	PTE6D5	GP2-333-502	#101C1	Vert. Integrator Net.
C	.005	·	}	P688-005	}	PTE6D5	GP2-333-502	·	} Vert. Integrator Net.
C61	4700	500	250161-24	1464-005		1DR5D4		MS-25	Vert. Osc. Grid
C62	.1	600	250203-13	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Discharge
C63	.047	600	250203-11	P688-047	DF-503	PTE6S5		6TM-S47	Vert. Sweep Coupling
C64	.0047	600	250203-5	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Vert. Sweep Coupling
C65	47	500	250187-49	1468-00005	D6-470	5W5Q5	GP1K-470	1FM-45	Horiz. Sync. Coupling
C66	.047	600	250203-11	P688-047	DF-503	PTE6S5		6TM-S47	AFC Plate
C67	.022	600	250203-9	P688-022		PTE6S2		6TM-S22	AFC Filter
C68	.47	200	250205-17	P288-47		GT2P5		2TM-P47	AFC Filter
C69	.047	600	250203-11	P688-047	DF-503	PTE6S5		6TM-S47	AFC Filter
C70	180	500	250159-53	1469-0002		5R6T2		MS-32	Horiz. Osc. Grid
C71	.01	600	250203-7	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Fixed Trimmer
C72	1000	500	250180-64	1468-001	D6-102	1W5D1	GP2L-102	1FM-21	Horiz. Discharge
C73	560	500	250159-130	S1560	D6-561	1W5T6	GP2K-561	MS-36	Horiz. Sweep Coupling
C74	82	500	250187-52				GP1K-820		Horiz. Feedback
C75	.047	600	250203-11	P688-047	DF-503	PTE6S5		6TM-S47	Horiz. Output Screen
C76	470	500	250159-90	1469-0005		5R5T5		MS-35	Horiz. Output Cathode •
C77	.1	200		P288-1		PTE4P1		2TM-P1	Horiz. Output Dec. •
C78	.033	600	250203-10	P688-033					Damper Filter
C79	.1	600	250203-13	P688-1		PTE6P1		6TM-P1	Damper Filter
C80	.1	600	250203-13	P688-1		PTE6P1		6TM-P1	Damper Filter
C81	500	20000	250189-1	#V30C	TV3-502				HV Filter
C82	33	500		S133	D6-330		GP1K-330	5GA-Q33	Ant. Line Isolation •

* Not used in all models.
† This Part number replaces C1A and C1B only.
♦ Items C60A, C60B, C60C, R75A, R75B, R75C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MAGNAVOX PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	2000Ω	1	220076-42	Q11-110	AM-11-S	B-6-S	Contrast Control
B	Shaft		Not req.	Not req.	FS-3	Not req.	Attach to R1A per instructions
C	Switch		Not req.	76-2	SWA-2	Not req.	Attach to R1A per instructions
R2A	1Meg	½	220076-19	Q13-137	AG-63-Z	B-70	Volume Control
B	Shaft		Not req.	Not req.	FS-3	Not req.	Attach to R2A per instructions
R3A	50KΩ	½	220076-15	Q11-123	AG-44-S	B-31	Horiz. Hold Control
B	Shaft		Not req.	Not req.	FS-3	Not req.	Attach to R3A per instructions
R4A	1.5Meg	1	220076-37	Q11-138	AG-83-S	B-75	Vert. Hold Control
B	Shaft		Not req.	Not req.	FS-3	Not req.	Attach to R4A per instructions
R5A	50KΩ	½	220076-15	Q11-123	AM-44-S	B-31	Brightness Control
B	Shaft		Not req.	Not req.	FS-3	Not req.	Attach to R5A per instructions
R6A	1.5Meg	½	220076-28	Q11-138	AG-83-S	AN-75	Height Control
B	Shaft		Not req.	Not req.	FKS-1/4	AK-1	Attach to R6A per instructions
R7A	1Meg	½	220076-41	Q11-137	AG-61-S	AN-69	Vert. Linearity Control
B	Shaft		Not req.	Not req.	FKS-1/4	AK-1	Attach to R7A per instructions
R8	30Ω	2	220076-10	W-30X15	RTV-15	SVT-902	Vert. Centering Control - Wire Wound - Center tapped
R9	30Ω	4	220076-9		43-50	SVT-902	Horiz. Centering Control - Wire Wound

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MAGNAVOX PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R10	3300Ω	½	230104-68	BTS-3300	Antenna Coil Shunt
R11	22KΩ	½	230104-78	BTS-22K	RF Amp. Grid
R12	6800Ω	1	230105-72	BTA-6800	RF Amp. Screen - See Note 2
R13	1000Ω	½	230104-62	BTS-1000	RF Amp. Plate Decoupling
R14	15KΩ	1	230105-76	BTA-15K	Voltage Divider
R15	6800Ω	½	230104-72	BTS-6800	RF Coil Shunt
R16	100KΩ	½	230104-86	BTS-100K	Mixer Grid
R17	220KΩ	½	230104-90	BTS-220K	Mixer Grid
R18	33KΩ	½	230104-82	BTS-33K	Mixer Plate - See Note 3
R19	22KΩ	½	230104-78	BTS-22K	Osc. Grid
R20	5600Ω	1		BTA-5600	Osc. Plate - See Note 4
R21	2200Ω 5%	½	230104-66	BTS-2200-5%	Osc. Coil Shunt - See Note 21
R22	1800Ω	1		BTA-1800	Decoupling - See Note 1
R23	150Ω	½	230104-52	BTS-150	Decoupling - See Note 1
R24	100KΩ	½	230104-86	BTS-100K	AGC Network
R25	120KΩ	½	230104-87	BTS-120K	AGC Network
R26	15KΩ	½	230104-76	BTS-15K	1st. Video IF Amp. Grid - See Note 5
R27	68Ω	½			1st. Video IF Amp. Cathode
R28	100Ω	½	230104-50	BTS-100	1st. Video IF Amp. Decoupling - See Note 1
R29	100Ω	½	230104-50	BTS-100	Decoupling - See Note 1
R30	8200Ω	½	230104-73	BTS-8200	2nd. Video IF Transformer Shunt - See Notes 4 and 6
R31	10KΩ	½	230104-74	BTS-10K	AGC Network - See Note 1
R32	68Ω	½			2nd. Video IF Amp. Cathode - See Note 21
R33	100Ω	½	230104-50	BTS-100	Decoupling
R34	100Ω	½	230104-50	BTS-100	Decoupling - See Note 1
R35	6800Ω	½	230104-179	BTS-6800	3rd. Video IF Transformer Shunt - See Notes 7 and 8
R36	150Ω	½	230104-53	BTS-150	3rd. Video IF Amp. Cathode
R37	680KΩ	½	230104-96	BTS-680K	AGC Load
R38	1Meg	½	230104-98	BTS-1Meg	AGC Network
R39	100Ω	½	230104-50	BTS-100	Bias Network - See Note 1
R40	1000Ω	½	230104-62	BTS-1000	Bias Network - See Note 1
R41	82KΩ	½	230104-85	BTS-82K	Voltage Divider - See Note 1
R42	4700Ω	½	230104-70	BTA-4700	Video Det. Diode Load - See Note 9
R43	2.2Meg	½	230104-102	BTS-2.2Meg	Video Amp. Grid
R44	22KΩ	1	230105-78	BTA-22K	Video Amp. Screen

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MAGNAVOX PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R45	5600Ω	2	230106-71	BTB-5600	Video Amp. Plate
R46	1800Ω	½		BTS-1800	Contrast Control Shunt - See Notes 1 and 10
R47	1500Ω	2		BTB-1500	Video Amp. Decoupling - See Notes 1 and 2
R48	220KΩ	½	230104-90	BTS-220K	Isolation
R49	47KΩ	1	230105-62	BTA-47K	Voltage Divider - See Note 11
R50	1.5Meg	½	230104-100	BTS-1.5Meg	Picture Tube Grid - See Note 12
R51	470KΩ	½	230094-223	BTS-470K	Picture Tube Cathode
R52	39KΩ	½	230104-81	BTS-39K	Sound IF Amp. Grid
R53	82Ω	½	230104-49	BTS-82	Sound IF Amp. Cathode - See Note 1
R54	33KΩ	½		BTS-33K	Sound IF Amp. Screen - See Notes 6 and 13
R55	1000Ω	½	230104-62	BTS-1000	Sound IF Amp. Decoupling
R56	6800Ω 5%	½	230094-179	BTS-6800-5%	Ratio Det. Diode Load
R57	6800Ω 5%	½	230094-179	BTS-6800-5%	Ratio Det. Diode Load
R58	220Ω	½	230104-54	BTS-220	Balancing
R59	68KΩ	½	230104-84	BTS-68K	De-emphasis
R60	4.7Meg	½	230104-106	BTS-4.7Meg	AF Amp. Grid - See Note 20
R61	470KΩ	½	230104-94	BTS-470K	AF Amp. Plate - See Note 20
R62	1Meg	½	230104-98	BTS-1Meg	Bias Network - See Note 14
R63	470KΩ 5%	½	230094-223	BTS-470K-5%	Output Grid
R64	3300Ω	10	240021-18	1 3/4A-3500	Voltage Divider - Wire wound
R65	10KΩ	½	230104-74	BTS-10K	Isolation
R66	240KΩ 5%	1			Isolation - See Note 15
R67	2.2Meg	½	230104-103	BTS-2.2Meg	Sync. Amp. Grid
R68	47KΩ	½	230104-82	BTS-47K	Sync. Amp. Plate
R69	270KΩ	½	230104-91	BTS-270K	Sync. Sep. Cathode
R70	270KΩ	½	230104-91	BTS-270K	Sync. Sep. Plate
R71	15KΩ	½	230104-76	BTS-15K	Voltage Divider
R72	1Meg	½	230104-98	BTS-1Meg	Sync. Clipper Grid
R73	22KΩ	½	230105-78	BTA-22K	Sync. Clipper Plate - See Note 16
R74	39KΩ	½	230105-81	BTS-39K	Voltage Divider
R75A	22KΩ	½	230186-1 ♦	BTS-22K	Integrator
B	8200Ω	½		BTS-8200	Integrator
C	8200Ω	½		BTS-8200	Integrator
R76	270KΩ	½	230104-91	BTS-270K	Vert. Osc. Plate - See Note 12
R77	2200Ω 5%	½		BTS-2200-5%	Vert. Peaking
R78	1800Ω	½		BTS-1800	Vert. Retrace Blanking Network - See Note 17
R79	1.5Meg	½	230104-100	BTS-1.5Meg	Vert. Output Grid
R80	820Ω	½	230105-61	BTA-820	Vert. Output Cathode - See Note 18
R81	1500Ω	2	230106-84	BTB-1500	Vert. Output Decoupling - See Note 2
R82	56KΩ	½		BTS-56K	Vert. Osc. Decoupling - See Note 1
R83	330KΩ	1	230104-92	BTA-330K	Horiz. AFC Grid - See Note 2
R84	820KΩ	½	230094-231	BTS-820K	Horiz. AFC Grid
R85	82KΩ	½	230104-85	BTS-82K	Horiz. AFC Cathode
R86	330KΩ	1	230104-92	BTA-330K	Horiz. AFC Cathode
R87	3900Ω	½	230104-69	BTS-3900	Horiz. AFC Filter
R88	100KΩ	½	230104-86	BTS-100K	Horiz. AFC Plate
R89	120KΩ	1	230104-87	BTA-120K	Voltage Divider
R90	150KΩ 5%	½	230104-88	BTS-150K-5%	Horiz. Osc. Grid
R91	82KΩ	1	230105-85	BTA-82K	Horiz. Osc. Plate - See Note 2
R92	8200Ω	½	230104-73	BTS-8200	Horiz. Osc. Coil Shunt
R93	150KΩ 5%	½	230104-88	BTS-150K-5%	Horiz. Feedback
R94	47Ω	½	230104-46		Parasitic Suppressor
R95	1Meg	½	230104-98	BTS-1Meg	Horiz. Output Grid
R96	28,300Ω	10			Horiz. Output Screen - Wire Wound - See Note 19
R97	1000Ω	10		1 3/4A-1000	Decoupling - Wire Wound - See Note 1
R98	1Meg	1	230105-98		HV Filter

♦ Items R75A, R75B, R75C, C60A, C60B, and C60C are combined into one unit.
Note 1 Not used in all models.
Note 2 Some models use Parallel resistors in this application to obtain desired value.
Note 3 Some models use 47KΩ resistor in this application.
Note 4 Some models use 6800Ω resistor in this application.
Note 5 Some models use 10KΩ resistor in this application.
Note 6 Some models use 22KΩ resistor in this application.
Note 7 Some models use 3300Ω resistor in this application.
Note 8 Some models use 8200Ω resistor in this application.
Note 9 Some models use 5600Ω resistor in this application.
Note 10 Some models use 2200Ω resistor in this application.
Note 11 Some models use 180KΩ resistor in this application.
Note 12 Some models use 470KΩ resistor in this application.
Note 13 Some models use 15KΩ resistor in this application.
Note 14 Some models use 820KΩ resistor in this application.
Note 15 Some models use 270KΩ resistor in this application.
Note 16 Some models use 68KΩ resistor in this application.
Note 17 Some models use 3900Ω resistor in this application.
Note 18 Some models use 1500Ω resistor in this application.
Note 19 Some models use 38KΩ resistor in this application.
Note 20 Used in TV models only.
Note 21 Some models use 82Ω resistor in this application.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: MAGNAVOX PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	PM	3.4Ω		STI15 Model P8-V	8A31	
	CONE DIA.	V. C. DIA.				
SP2	7 3/8"	9/16"				

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MAGNAVOX PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC ② 1.7A	720VCT .210ADC	5VAC ② 3A	6.3VAC ② 1.55A SEC. 4 6.3VAC ② 5A	300059-1		P-3069	

PARTS LIST CONTINUED ON PAGE 15

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA MAGNAVOX PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	140Ω	1.32KΩ	320030-6	A-8122	A-4000 ①	TBO-1	Vert. Block Osc. Trans.
T3	310Ω	10.5Ω	320055-1		HVO-7		Horiz. Output Trans.
	Tap 25.5Ω	Tap .7Ω & 8.3Ω					
		SEC. 2 0Ω					
T4	820Ω	13Ω	320056-2	A-8112 ①	A-3036	TSO-5 ①	Vert. Output Trans.
T5A	13Ω		360462-6	DY-7	MDF-70		Horiz. Deflection Coils
B	46Ω						Vert. Deflection Coils

① Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA MAGNAVOX PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T6	5.3KΩ	3.4Ω	540Ω	.6Ω		A-3849	A-3019	RO-9 ①	Drill one new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA MAGNAVOX PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.150A	55Ω	1 Henry	320041-3	C-2326	C-2994	TR-3300 ①	① Drill one new mount-
L2	.050A	55Ω	1 Henry	320041-3	C-2326	C-2994	TR-3300 ①	ing hole.

COILS (RF-IF)

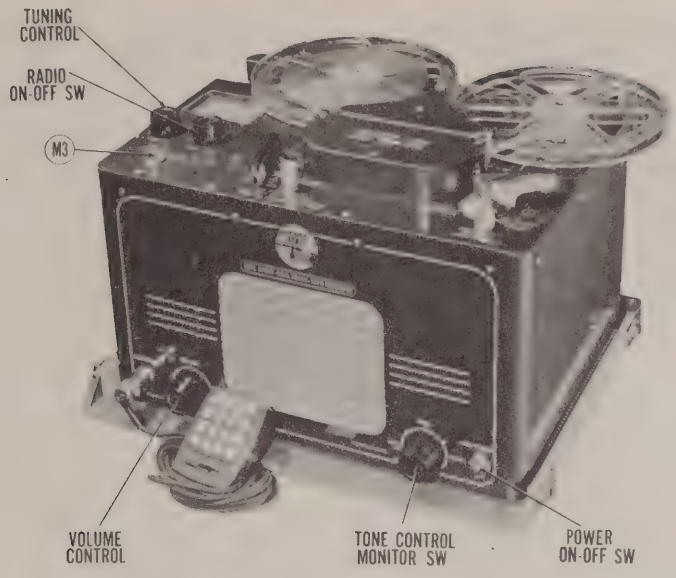
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MAGNAVOX PART No.		IRC PART No.	NOTES
L3	Ant. Trans.	0Ω	0Ω	360490-2			
L4	Ant. Coils	0Ω					
L5	RF Coils	0Ω					
L6	Fil. Choke	.2Ω		360372-1		CLA	.47 Microhenries
L7	Mixer Grid Coils	0Ω					
L8	Osc. Coils	0Ω					
L9	Fil. Choke	.2Ω		360372-1		CLA	.47 Microhenries
L10	1st. Video IF	.7Ω	Tap .3Ω	360468-1			
L11	Fil. Choke	0Ω		360332-11			Not used in all models
L12	2nd. Video IF	.5Ω	.5Ω	360461-1			
L13	Fil. Choke	.2Ω		360372-1		CLA	.47 Microhenries(not used in all models)
L14	3rd. Video IF	.5Ω	.5Ω	360461-1			
L15	4th. Video IF	.5Ω	.5Ω	360461-1			
L16	Fil. Choke	.2Ω		360372-1		CLA	.47 Microhenries(not used in all models)
L17	Peaking	5Ω		360443-12			Yellow dot
L18	Peaking	10Ω		360443-2			Red dot
L19	Peaking	8Ω		360443-13			Wound on 39KΩ resistor (Brown dot)
L20	Peaking	10Ω		360443-14			Wound on 5.6KΩ resistor (Green dot)
L21	Sound IF	1Ω		360481-1			
L22	Ratio Det. Trans.	2.4Ω	.2Ω	360482-1			Tap .7Ω
L23	Horiz. Osc.	60Ω	50Ω	360479-1			Tap 23Ω
L24	Horiz. Size	.9Ω		360357-1			
L25	Horiz. Lin.	7Ω	Tap 3.1Ω	360358-1			

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA MAGNAVOX PART No. FUSE	MAGNAVOX PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	REMARKS
M1	3AG Pigtail	.250A	180475-1		318.250		

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M2	RF Tuner	700349-1	
M3	Focus Magnet	360485-1	
M4	Ion Trap	360492-1 (or) 360422-2	
B3, B4	Trimmer	260106-3	Dual (Horiz. lock - Horiz. drive)



MASCO
MODEL D37R

MASCO
MODEL D37R

GENERAL INFORMATION

The Masco Models D-37, D-37R, DC-37R, LD-37 and LD-37R Tape Recorders are designed to magnetically record two tracks of recording material on a standard .248" width ribbon at a tape speed of 3.75" per second or 7.50" per second. The mechanism is equipped with a fast-rewind requiring approximately 3 minutes for 1200 feet of tape (7" reel). These units have two input channels - Microphone and Radio - Phono - and two amplifier controls - Volume and Tone. There are two outputs, External Speaker and External Amplifier.

Recordings may be made from Microphone and Radio or Phonograph. In models D-37R, LD-37R, DC-37R recordings may be made directly from the built-in radio.

Power Consumption: 80 watts at 117 volts, 60 cycles on models (D-37, DC-37, LD-37) 95 watts at 117 volts, 60 cycles on Models (D-37R, DC-37R, LD-37R).

Power Output: 5 watts (to internal or external speaker).

Hum Level: 50db below full output.

Frequency Response: 80-8500 cps + 3db at 7.50"/sec.
80-500 cps + 3db at 3.75"/sec.

Signal to Noise -

Ratio: 45db at 7.50"/sec.
40db at 3.75"/sec.

Erase and Bias Frequency: 60KC

Inputs: Microphone - 1 megohm impedance, .003 volts sensitivity.
Radio-Phono - 0.5 megohm impedance, 9.4 volts sensitivity.
External Speaker - 8-16 ohm voice coil, 5 watts.
External Amplifier - 500 ohm, 1.7 volts to line or amplifier.

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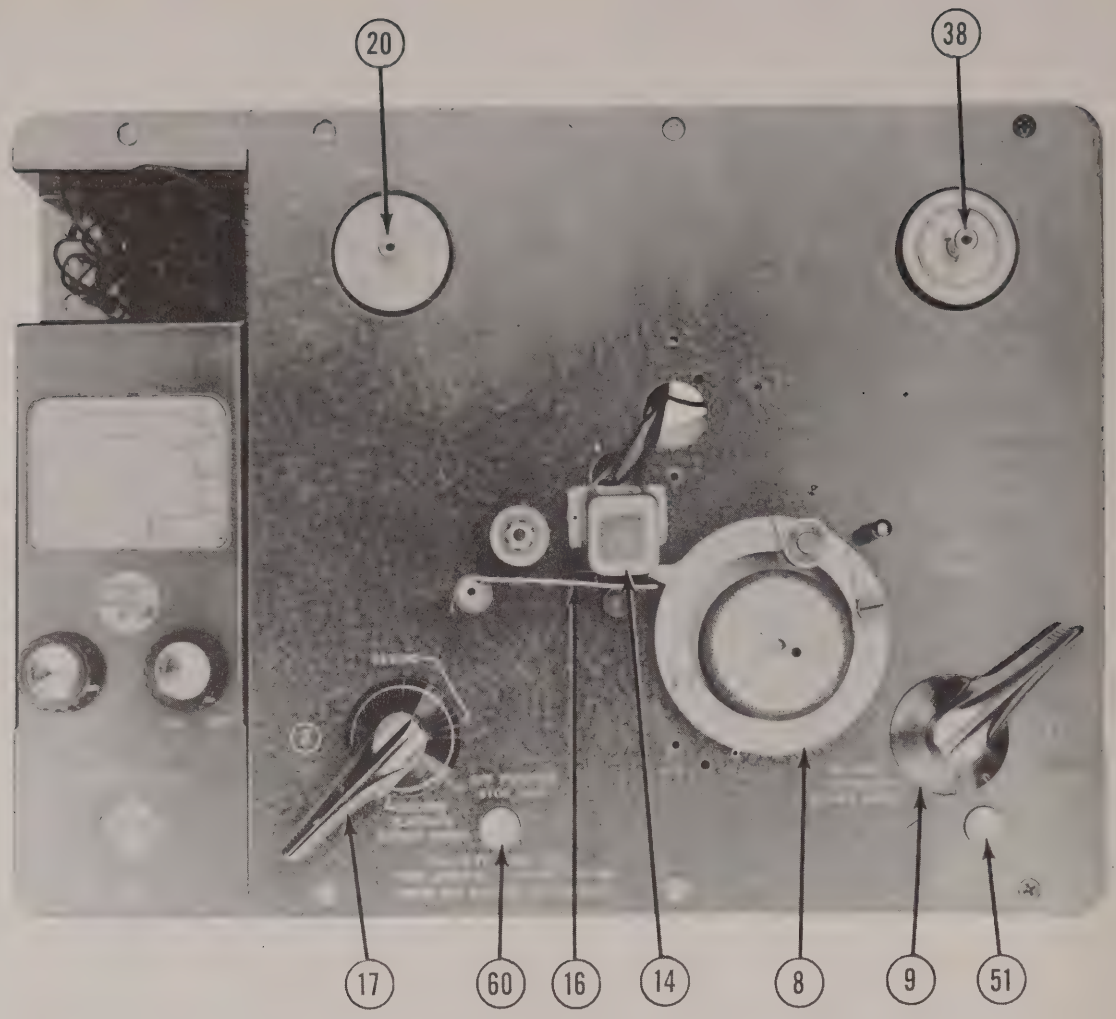


Figure No. 2

OPERATING INSTRUCTIONS

To Prepare Masco for Recording -

1. Insert the AC power cord into a convenient receptacle of the proper rating, 117 volts, 60 cycle AC.

2. Make certain that the control levers (9) and (17) are in the "Off" position.

3. Place the Main Power Switch to "On."

4. Place an empty reel on the Take-Up Spindle, (38).

5. Place a full reel of tape on the Supply Spindle, (20) so that the glossy side of the tape faces outward and the tape will unwind in a counterclockwise direction.

NOTE: Make sure that the reel slots engage the keys on their respective spindles.

6. Unwind about 2 feet of tape from the Supply Reel and drop the tape in the Tape Slot. The tape should be in front of the guide pin as shown in Figure 1.

7. Feed the end of the tape through one of the Radial Slots in the Take-Up Reel. Hold the end of the tape and turn the reel counterclockwise to make sure the tape is firmly fastened and also to take up all the slack in the tape.

Recording from Microphone -

If the above procedure has been followed, the Pilot Light should be glowing steadily, indicating the recorder is ready to operate.

1. Plug microphone into Microphone Input.

2. Push down on Record Button (51) and while holding it in a downward position, turn the Control Knob (9) (or Knob 1 which is stamped on base plate) to "Record." The Pilot Light will now go out and will act as a Recording Volume Level Indicator.

3. Hold the microphone about 6 to 12 inches from the mouth and while speaking into the microphone in a normal tone, rotate the Volume Control clockwise until the Recording Level Indicator flickers on high peaks. The machine is now ready to record.

4. Turn the Control Knob (17) (or No. 2 which is stamped on the baseplate) to "Record." The tape is

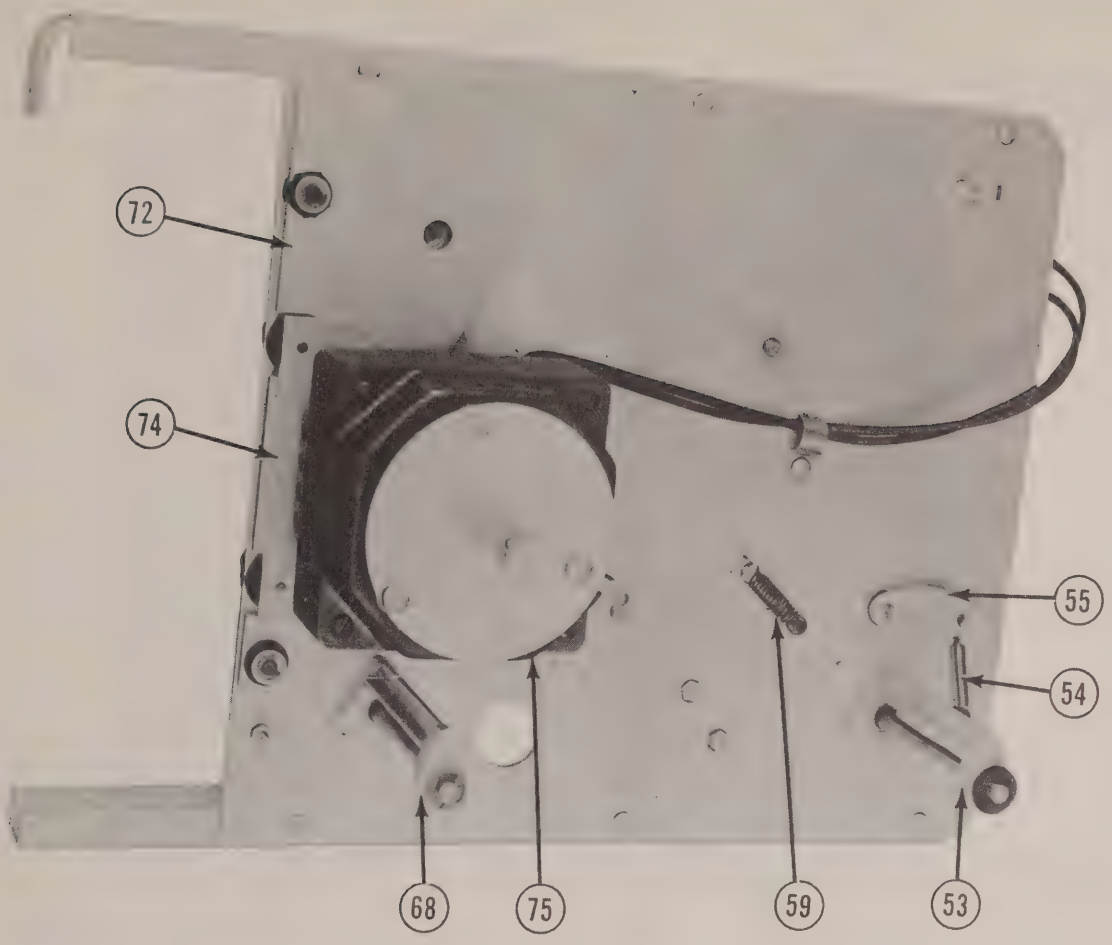


Figure No. 3

now moving and whatever enters the microphone will be recorded on the tape.

5. To listen to what is being recorded on the tape, turn the Monitor Speaker-Tone Control Switch to "On." The Tone Control has no effect while recording. However, it is not recommended to use the Monitor Speaker Switch when using the microphone as feed back may occur. Headphones may be used to monitor what is being recorded on the tape by plugging the headphones into the External Speaker Jack.

NOTE: To record at 7.50 inches per second (for high fidelity reproduction), rotate the Control Knob (17) to Record - Play position as described in Step 4.

To record at 3.75 inches per second, push down on the 3.75 Push Button (60) and, while holding it in this position, rotate the Control Knob (17) to Record - Play.

To Record from External Radio, Phonograph, Tape or Wire Recorder -

1. Thread the tape and set the controls as described under "Recording from Microphone."

2. The output of any radio, phonograph, wire or tape recorder may be connected through a suitable cable to the Radio - Phonograph Input. An output of 0.5 volts, or more, is required.

3. To listen to the recording being made, turn the Monitor Speaker and Tone Control Switch "On."

To Record from Built-In Radio (Models D-37R, DC-37R, LD-37R) -

1. Thread the tape on the machine.

2. Turn Main Power Switch "On."

3. Push down on "Record" button (51) and, while holding in downward position, turn the Control Knob (9) to Record - Play position.

4. Turn Monitor Speaker Switch and Tone Control to "On."

5. Turn Radio Switch to "On."

6. Tune in desired station. The hank of antenna wire supplied should be extended about the room or may be connected to an external antenna.

7. Adjust the Volume Control Knob until the Recording Level Indicator Bulb flashes on high peak.

8. Turn knob (17), or No. 2 which is stamped on the top plate, to Record Playback position. If 3.75 speed is required, push down on the push button (60) and, while holding it in a downward position, turn knob (17) to Record Playback. A recording is now being made.

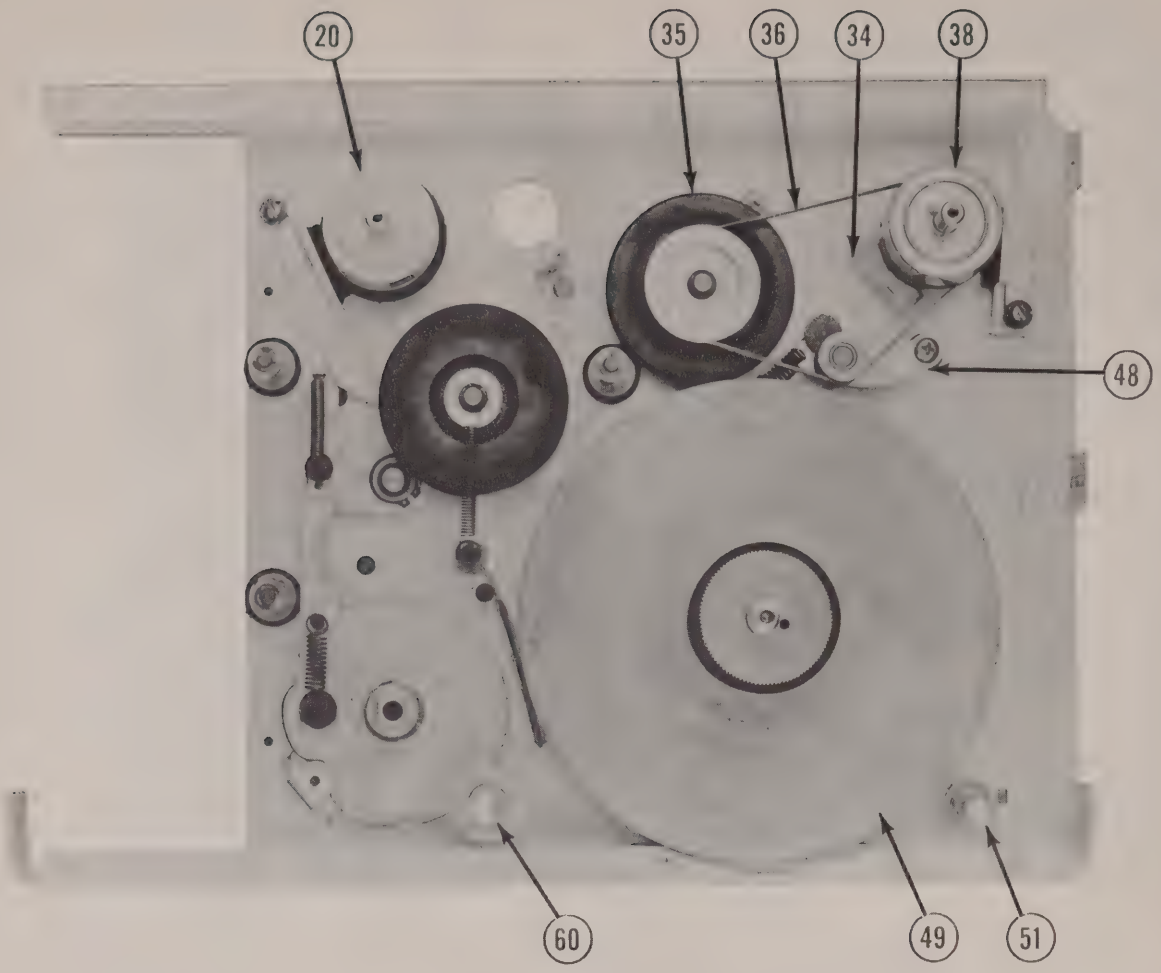


Figure No. 4

To Record on the Second Track -

1. After the entire reel has been recorded, turn both control levers Nos. 1 and 2 to their "Off" positions.

2. Remove both reels; turn the full reel over and place it on the left-hand spindle, or Supply Reel Spindle (20), and place the empty reel on the Take-Up Reel Spindle.

3. Thread the tape as described under "To Prepare Masco for Recording." The recorder is now ready to record the second sound track.

To Stop the Recorder -

1. To stop the recorder at any time, always turn Control Lever No. 2 first to the Stop - Tape position; then turn Control Lever No. 1 to Stop - Tape position.

To Rewind -

1. Control Lever No. 1 should be in the "Off" position.

2. Turn Control Lever No. 2 counterclockwise to "Rewind."

3. Turn Volume Control down.

To Playback a Recording -

1. Turn Main Power Switch "On."

2. Properly thread the tape on the machine.

3. Turn Control Lever No. 1 to "Playback."

4. Rotate the Control Lever No. 2 to "Playback."

NOTE: Recordings made at 3.75" per second must be played back at the same speed, the same holds true for recordings made at 7.50" per second.

5. Adjust Volume and Tone Controls to suit.

To Operate as a "P.A." System -

1. For Microphone:

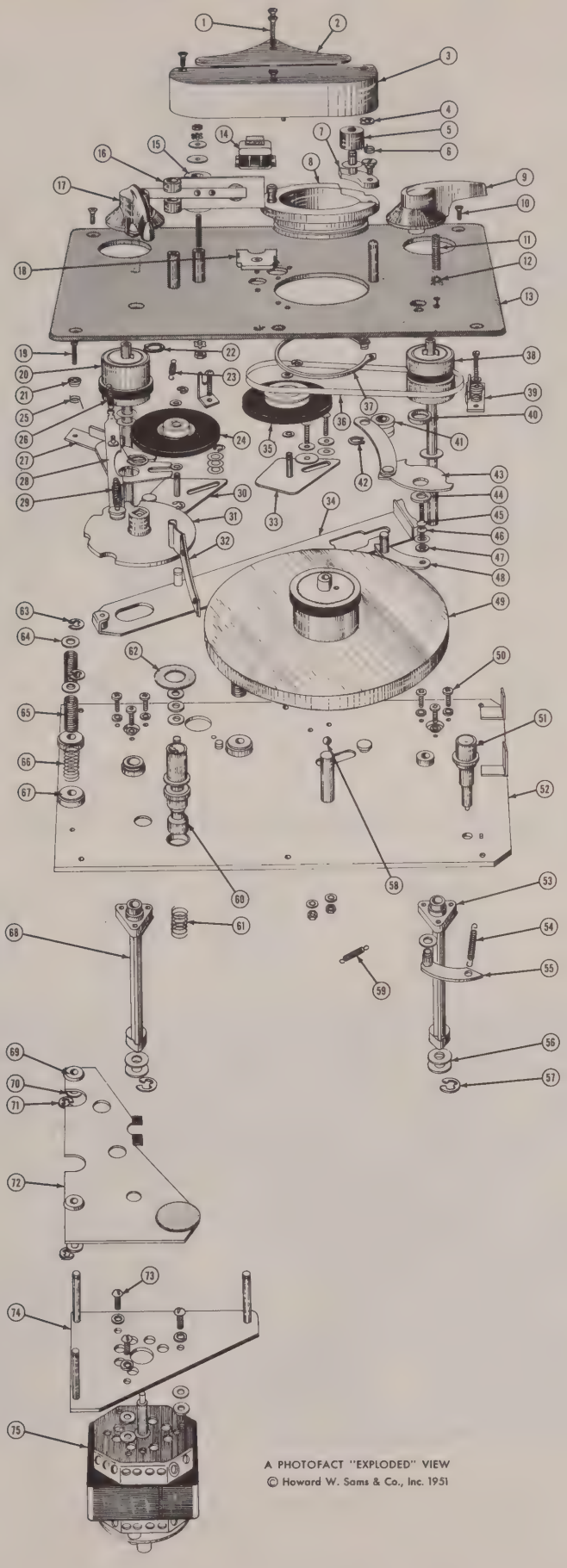
(a) Turn Main Power Switch "On."

(b) Plug microphone into "Microphone Input."

(c) Turn Monitor Speaker Switch and Tone Control to "On."

(d) Press down on the "Record" push button (51) and rotate control lever (9) to "Record."

(e) Speak into microphone in a natural voice and adjust Volume Control to suit.



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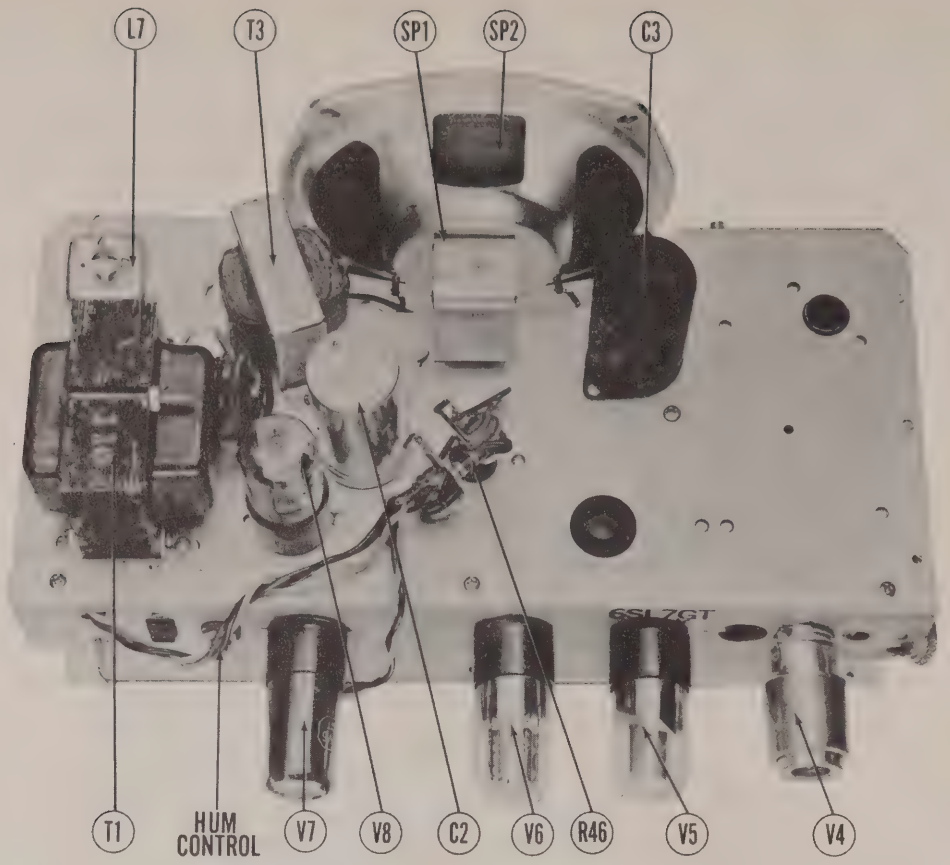

Figure No. 5

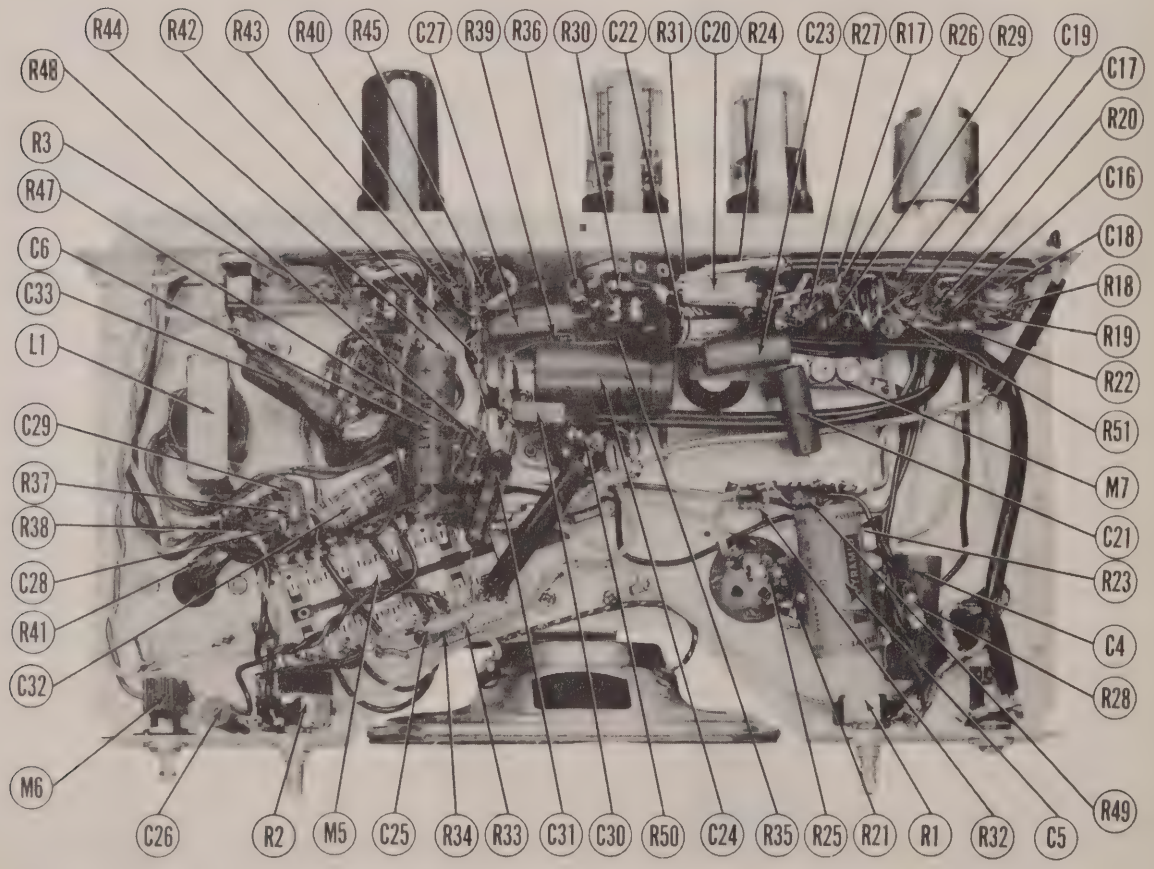

Figure No. 6

MASCO
MODEL D37R

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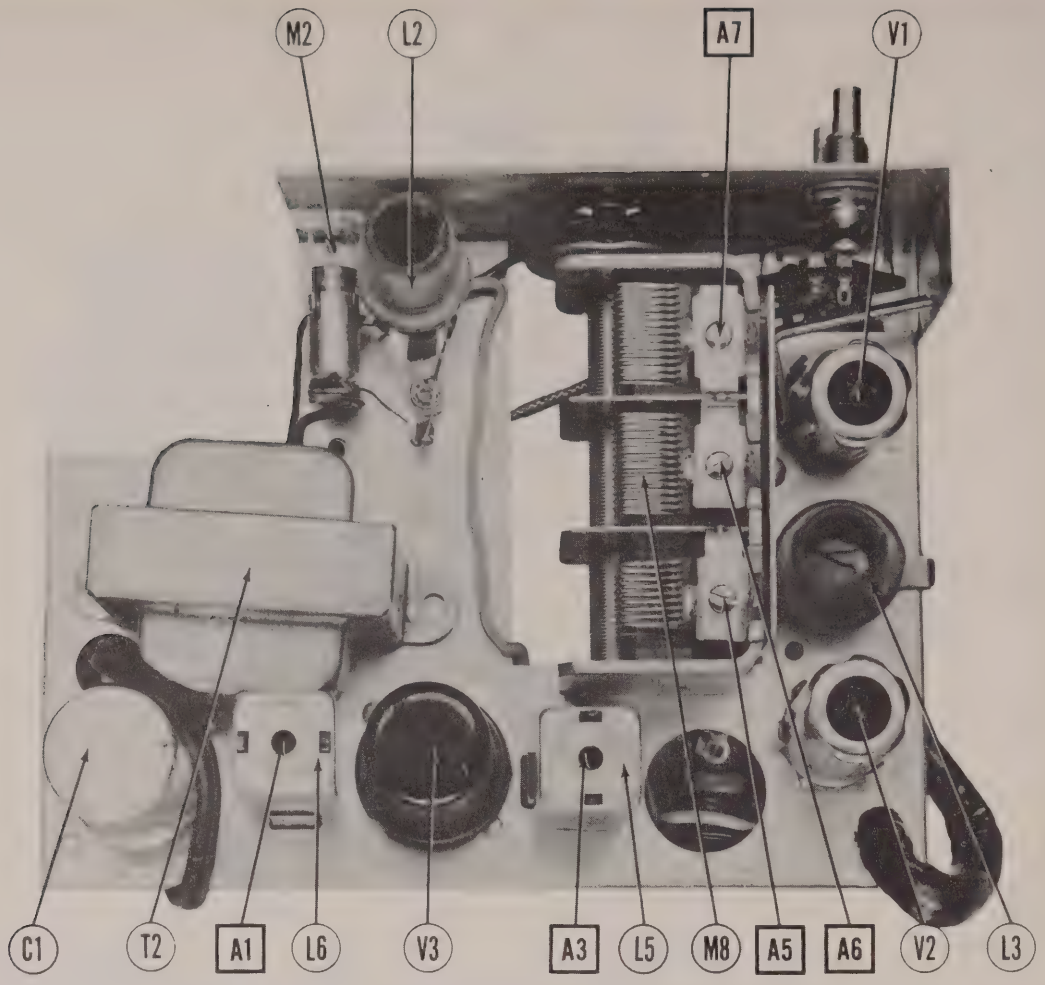


Figure No. 7

2. For Radio or Phonograph:

(a) Set the controls the same as for microphone.

(b) Plug the output of the radio or phonograph into the input marked "Radio - Phono."

To Repair or Splice Tape -

In case the tape is broken accidentally, or it is desired to edit a recording, a splice may be made with Scotch tape. Do not use medical adhesive tape as the adhesive material is not suited for this purpose. The Scotch tape should be applied to the reverse, or uncoated, side of the recording tape. The edges of the splice should be trimmed with a small pair of scissors, or a knife, to bring the width of the splice to that of the rest of the recording tape.

Reels of tape should be stored where they will not be subjected to extremes of temperature and humidity.

Rewind tape once before using when it has been stored 6 months or longer.

It is recommended that a new reel of tape be rewound once before recording.

Cleaning the Capstan and Recording Head -

The rubber surface of the flywheel and capstan (49) and the recording head (14) should be cleaned periodically to remove accumulation of foreign matter and dust.

To gain access to the capstan and recording head, remove the two Phillips head screws (1) and lift off the rear trim cover (2). Cleaning is accomplished by means of a cloth dipped in carbon tetrachloride.

TROUBLES

Motor Runs but Mechanism Fails to Operate in Forward Position -

1. Idler wheel tension spring (23) broken or not connected.

(a) If this spring (23) is not properly connected, the idler wheel will not be held in engagement with the motor shaft and flywheel (49). To gain access to the operating mechanism, the trim cover (2) and (3) and the top plate (13) must be removed.

Tape Moves Past Recording Head but Fails to Wind on Take-Up Reel -

1. Take-Up Spindle drive belt (36) broken.

(a) Replace with new belt (36). Before installing new belt, clean the drive surfaces, with which

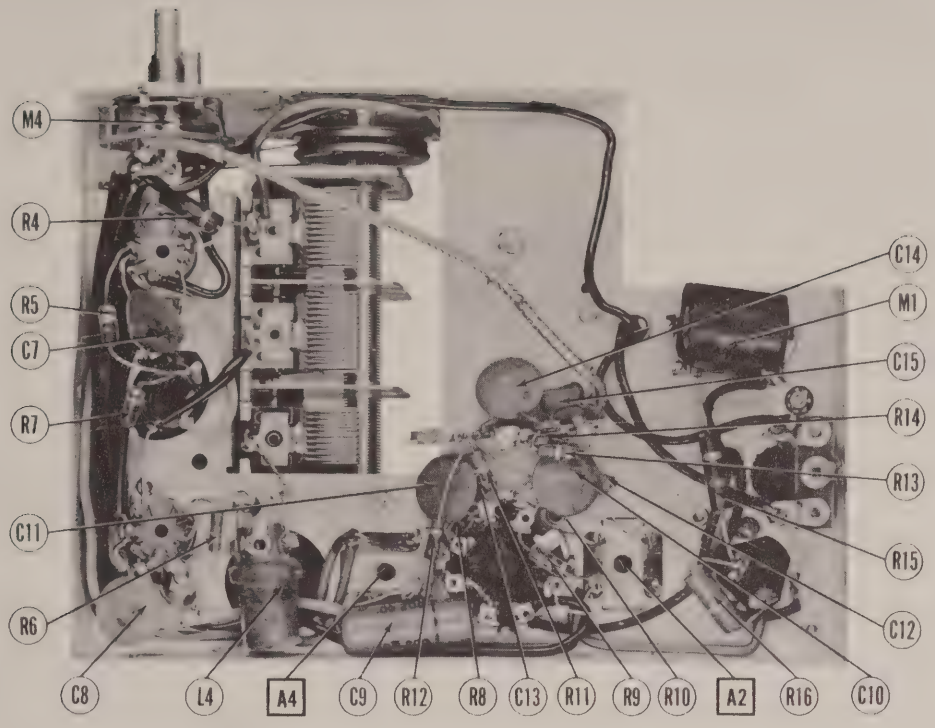


Figure No. 8

the belt comes in contact, with carbon tetrachloride.

2. Spring (54) broken or not connected.

(a) If spring (54) is not connected to the tension arm (55), the idler pulley (41) and arm (48) will not be held against the belt (36). With spring (54) properly connected, the idler pulley (41) should maintain enough pressure against the drive belt (36) in order for the drive belt (36) to rotate the Take-Up Spindle.

3. Idler arm (48) loose on the tension arm (55).

(a) To gain access to the idler arm (48), remove the trim cover (2) and (3) and the top plate (13).

(b) Remove the belt (36) from the pulley (41); then move the idler pulley (41) against the flywheel (49) and tighten the screw (46).

(c) Replace the drive belt (36) top plate and trim covers.

Speed Variation or "Wow" -

1. Check the motor shaft, main drive pulley (24), and capstan (49) for oil or foreign material on their drive surfaces.

(a) Clean the drive surfaces with carbon tetrachloride.

2. Spring pressure on pressure pad assembly too great.

(a) Remove trim cover (3) and lift off pressure pad assembly (16).

(b) Bend the leaf spring on the pressure pad assembly so as to relieve some of the pressure on the recording head when reassembled.

(c) Replace pressure pad assembly and trim cover.

Distortion or Complete Failure to Record -

1. Recording head pressure pad not being held against the recording head by the lead spring on pad assembly (16).

(a) Remove trim covers (2) and (3).

(b) Remove the pressure pad assembly and bend the lead spring so as to apply more pressure to the head.

(c) Replace the pressure pad and trim covers.

2. Defective recording head.

3. Defective amplifier.

4. Record Push Button (51) not held when Control Lever (1) is turned to "Record."

Tape From Take-Up Reel Overruns When Machine is Turned From Rewind to Stop -

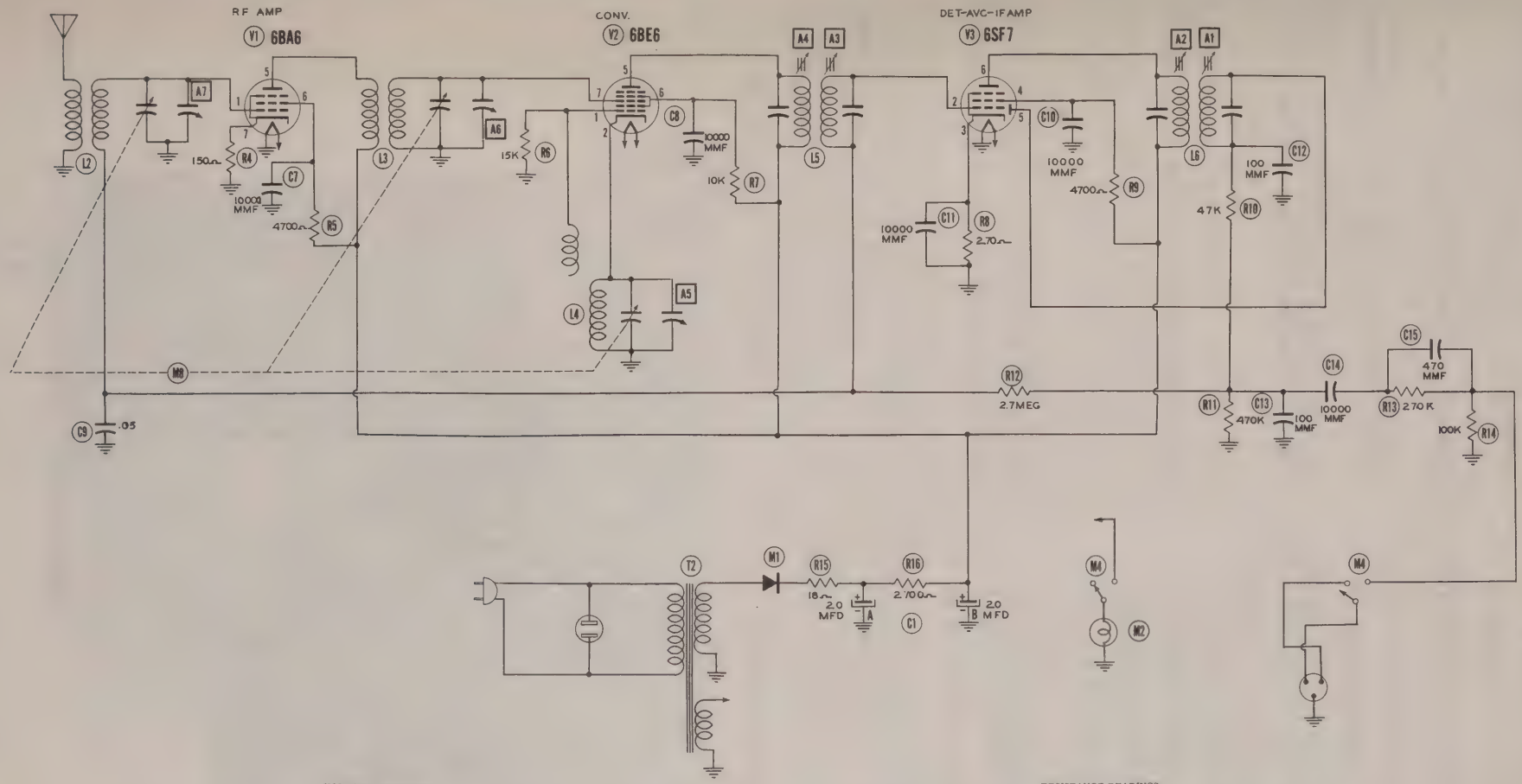
1. Spring on brake arm (39) broken.

2. Felt pad on brake arm (39) missing.

Motor Runs but Mechanism Fails to Record -

1. Spring (59) not connected to Index Slide (34).

(a) If this spring (34) is not connected to the Index Slide, the positioning cam (31) will not stay in its proper indexed location.



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BA6	-3VDC	0V	0V	6.3VAC	80VDC	65VDC	1.2VDC		
V 2	6BE6	§-2.3VDC	0V	0V	6.3VAC	90VDC	43VDC	0V		
V 3	6SF7	0V	0V	1.8VDC	65VDC	-.1VDC	75VDC	6.3VAC	0V	
V 4	12AX7	70VDC	0V	.4VDC	▲	▲	70VDC	0V	.3VDC	▲
V 5	6SL7GT	0V	110VDC	1.7VDC	0V	105VDC	1.7VDC	▲	▲	
V 6	6SN7GT	¶ 0V -.7VDC	¶240VDC 0V	¶6.7VDC 0V	0V	115VDC	4VDC	▲	▲	
V 7	6V6GT	0V	▲	240VDC	220VDC	-30VDC -.2VDC	0V	▲	¶7VDC 9VDC	
V 8	6X5GT	240VDC	▲	240VAC	0V	240VAC	0V	▲	270VDC	

§ TAKEN WITH VACUUM TUBE VOLTMETER.
▲ 6.3VAC MEASURED BETWEEN FILAMENTS.
¶ TAKEN IN RECORD POSITION.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BA6	3.3Meg	0Ω	0Ω	.2Ω	†3KΩ	†7KΩ	150Ω		
V 2	6BE6	15KΩ	.5Ω	0Ω	.2Ω	†2.8KΩ	†15KΩ	4.8Ω		
V 3	6SF7	0Ω	3Meg	270Ω	8.5KΩ	520KΩ	†2.8KΩ	.2Ω	0Ω	
V 4	12AX7	#280KΩ	200Ω	5KΩ	280Ω	280Ω	†270KΩ	500KΩ	5KΩ	Pin 9 280Ω
V 5	6SL7GT	470KΩ	#150KΩ	5KΩ	0Ω	#150KΩ	5KΩ	280Ω	280Ω	
V 6	6SN7GT	100K	¶ #700Ω	400Ω	470KΩ	#40KΩ	1.4KΩ	280Ω	280Ω	
V 7	6V6GT	0Ω	280Ω	#100Ω	6KΩ	270KΩ ¶100KΩ	Inf.	280Ω	260Ω	
V 8	6X5GT	300KΩ	280Ω	210Ω	Inf.	205Ω	Inf.	280Ω	35KΩ	

MEASURED FROM PIN 8 OF V8.
† MEASURED FROM OUTPUT OF M1

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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING		ADJUST	REMARKS
1.	.01mfd.	High side to stator on center section of tuning gang. Low side to chassis.	455KC (400∿Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	A5	"
3.	250mfd.	High side to ant. terminal on L2 (remove hank ant.). Low side to chassis	1500KC	Tune for maximum output.	"	A6, A7	"

PARTS LIST

Ref. No.	Description	Ref No.	Description
1	Mounting Screw for Rear Trim Cover	38	Take-Up Reel Spindle
2	Rear Trim Cover	39	Brake Arm-Take-Up Spindle
3	Front Trim Cover	40	Spacing Washer for Item (43)
4	"C" Washer for Tape Turret Roller	41	Idler Pulley
5	Tape Turret Roller	42	Tru-Arc
6	Wire Spring	43	Actuating Cam and Arm for Turret
7	Roller Arm	44	Washer - Special
8	Capstan Turret	45	Mounting Screw for Item (43)
9	Control Lever-Right Hand	46	Mounting Screw for Item (48)
10	Top Plate Mounting Screw	47	Internal Lock Washer
11	Spring for Indexing Control Lever, Item (9)	48	Idler Pulley Arm
12	Index Ball	49	Flywheel and Capstan
13	Top Plate	50	Mounting Screws for Item (53)
14	Recording and Erase Head	51	Record Button
15	Tape Guide	52	Main Base Plate
16	Tape Pressure Pad Assembly	53	Take-Up Spindle Bearing Shaft
17	Control Lever-Left Hand	54	Tension Spring for Item (48)
18	Recording Head Mounting Plate	55	Mounting Stud and Tension Arm for Item (48)
19	Supply Reel Brake Arm Mounting Screw	56	Flat Washers
20	Supply Reel Spindle	57	"C" Washer
21	Special Washer for Mounting Spring Item (25)	58	Ball Bearing for Flywheel
22	"C" Washer for Mounting Control Knob Item (17)	59	Tension Spring for Item (34)
		60	3.75 Speed Change Push Button
23	Tension Spring for Idler Wheel Item (24)	61	Compression Spring for Item (60)
24	Idler Wheel	62	Felt Washer
25	Wire Spring	63	"C" Washer for Mounting Item (74)
26	Tension Spring for Idler Wheel Pivot Arm	64	Flat Washer
27	Brake Arm-Supply Reel	65	Spring-Heavy
28	Idler Wheel Shifting Lever	66	Spring-Light
29	Tension Spring	67	Rubber Grommet
30	Idler Wheel Mounting Plate	68	Supply Spindle Bearing Shaft
31	Control Cam	69	Rubber Grommet - Motor Shifting Plate
32	Flywheel and Capstan Brake Spring	70	Flat Washer
33	Mounting Plate	71	"C" Washer
34	Control Lever	72	Motor Shifting Plate
35	Take-Up Drive Pulley	73	Motor Mounting Screw
36	Take-Up Drive Belt	74	Motor Mounting Plate
37	Retainer Ring for Turret Item (8)	75	Motor

ELECTRICAL PARTS LIST

Ref. No.	Description
V1	6BA6 RF Amplifier
V2	6BE6 Convertor
V3	6SF7 IF Amplifier - Detector - AVC
V4	12AX7 Playback Pre-Amplifier
V5	6SL7GT Mic. Pre-Amplifier - 1st AF Amplifier
V6	6SN7GT 2nd AF Amplifier - Monitor Amplifier
V7	6V6GT Bias Oscillator - Power Output
V8	6X5GT Rectifier
C1A	Filter (Electrolytic) 20 mfd. @ 150 Volts
C1B	Filter (Electrolytic) 20 mfd. @ 150 Volts
C2A	Filter (Electrolytic) 20 mfd. @ 450 Volts
C2B	Filter (Electrolytic) 20 mfd. @ 450 Volts
C2C	Decoupling (Electrolytic) 10 mfd. @ 450 Volts
C2D	Decoupling (Electrolytic) 10 mfd. @ 450 Volts
C3A	Mic. Pre-Amplifier Cathode (Electrolytic) 30 mfd. @ 150 Volts
C3B	Decoupling (Electrolytic) 30 mfd. @ 150 Volts
C3C	Playback Pre-Amplifier Cathode (Electrolytic) 20 mfd. @ 150 Volts
C4	1st AF Amplifier Cathode (Electrolytic) 50 mfd. @ 50 Volts
C5	Decoupling (Electrolytic) 16 mfd. @ 450 Volts
C6	Output Cathode (Electrolytic) 50 mfd. @ 50 Volts
C7	RF Amplifier Screen 10,000
C8	Oscillator Anode 10,000
C9	AVC Filter, .05 mfd. @ 200 Volts
C10	IF Amplifier Screen 10,000
C11	IF Amplifier Cathode 10,000
C12	Diode RF Filter 100
C13	Diode RF Filter 100
C14	Audio Coupling 10,000
C15	Tone Compensation 470
C16	Fixed Trimmer .002 mfd. @ 600 Volts
C17	Tone Compensation .001 mfd. @ 600 Volts
C18	Audio Coupling .05 mfd. @ 200 Volts
C19	Audio Coupling .05 mfd. @ 200 Volts
C20	Audio Coupling .05 mfd. @ 200 Volts
C21	Audio Coupling .05 mfd. @ 200 Volts
C22	Audio Coupling .1 mfd. @ 200 Volts*
C23	2nd AF Amplifier Cathode .05 mfd. @ 200 Volts
C24	Audio Coupling .5 mfd. @ 400 Volts
C25	Tone Compensation 470
C26	Tone Compensation .05 mfd. @ 200 Volts
C27	Audio Coupling .01 mfd. @ 600 Volts
C28	Oscillator Grid Cap 100
C29	Fixed Trimmer 3000 mmf. @ 500 Volts
C30	Oscillator Coupling 1000 mmf. @ 500 Volts
C31	Oscillator Coupling .002 mfd. @ 600 Volts
C32	Ouput Plate .003 mfd. @ 600 Volts
C33	Line Filter .05 mfd. @ 600 Volts
*Some models use .5 mfd. @ 200 Volts in this application.	
R1	Volume Control 500K ohms, 1/2 Watt
R2	Tone Control 500K ohms, 1/2 Watt
R3	Hum Control - Wire Wound 50 ohms, 1 Watt
R4	RF Amplifier Cathode 150 ohms, 1/2 Watt
R5	RF Amplifier Screen 4700 ohms
R6	Oscillator Grid 15K ohms
R7	Oscillator Anode, 10K ohms
R8	IF Amplifier Cathode 270 ohms
R9	IF Amplifier Screen 4700 ohms
R10	Diode Filter 47K ohms
R11	Diode Load 470K ohms
R12	AVC Network 2.7 Meg.
R13	Tone Compensation 270K ohms

Ref. No.	Description
R14	Tone Compensation 100K ohms
R15	Surge Limiter 18 ohms 1 Watt
R16	Filter - See Note 1, 2700 ohms, 1 Watt
R17	Playback Pre-Amplifier Filament 10 ohms, 1/2 Watt
R18	Playback Pre-Amplifier Cathode 4700 ohms
R19	Playback Pre-Amplifier Plate 100K ohms
R20	Playback Pre-Amplifier Grid 470K ohms
R21	Playback Pre-Amplifier Cathode 4700 ohms
R22	Playback Pre-Amplifier Plate 100K ohms
R23	Playback Pre-Amplifier Decoupling 270K ohms
R24	Mike, Pre-Amplifier Grid 1 Meg.
R25	Mike, Pre-Amplifier Cathode 4700 ohms 1/2 Watt
R26	Mike, Pre-Amplifier Plate 100K ohms
R27	1st AF Amplifier Grid 470K ohms
R28	1st AF Amplifier Cathode - See Note 2, 4700 ohms
R29	1st AF Amplifier Plate 100K ohms
R30	2nd AF Amplifier Grid 470K ohms
R31	2nd AF Amplifier Cathode 1500 ohms
R32	2nd AF Amplifier Plate 27K ohms
R33	Tone Compensation 47K ohms
R34	Tone Compensation 150K ohms
R35	Monitor Amplifier Grid 100K ohms
R36	Monitor Amplifier Cathode - See Note 3 390 ohms
R37	Parasitic Suppressor 27 ohms
R38	Bias Oscillator Grid 100K ohms
R39	Output Grid 470K ohms
R40	Output Cathode 270 ohms, 1 Watt
R41	Feedback 10K ohms, 1/2 Watt
R42	Voltage Divider 470K ohms
R43	Voltage Divider 100K ohms
R44	Indicator Network 100K ohms
R45	Indicator Network 47K ohms
R46	Series Ext. Amplifier Jack - See Note 3, 390 ohms
R47	Filter 500 ohms, 1 Watt
R48	Filter 5100 ohms, 1 Watt
R49	Filter 47K ohms, 1/2 Watt
R50	Erase Head Shunt 10K ohms
R51	Tone Compensation 100K ohms
Note 1: Some models use 2200 ohm resistor in this application.	
Note 2: Some models use 1000 ohm resistor in this application.	
Note 3: Some models use 470 ohm resistor in this application.	
T1	Power Transformer
T2	Filament Isolation Transformer
T3	Output Transformer
SP1	Speaker (PM)
SP2	Cone (3.2 ohms voice coil)
L1	Filter Choke
L2	Antenna Coil
L3	RF Coil
L4	Oscillator Coil
L5	Input IF
L6	Output IF
L7	Erase Oscillator Coil
M1	Selenium Rectifier
M2	Pilot Lamp, Type No. 47
M3	Neon Indicator
M4	Radio On-Off Switch
M5	Function Switch
M6	Power Switch
M7	Tone Compensation Switch
M8	Tuning Cap

MASCO
MODEL MB-60 (Late)

MASCO
MODEL MB-60 (Late)

TRADE NAME	Masco, Model MB-60 (Late)
MANUFACTURER	Mark Simpson Mfg. Co., Inc., 32-28 49th St., Long Island City 3, New York
TYPE SET	AC Operated Booster Amplifier
TUBES (SEVEN)	Types 6SL7GT 1st AF Amp., 6SN7GT 2nd AF-Phase Inv., (2) 807 Power Output, (3) 5Y3GT Rectifier
POWER SUPPLY	105-125 Volts AC RATING 1.3 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

MASCO
MODEL MB-60

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MASCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	1st AF Amplifier	6SL7GT	6SL7GT	8BD	
V2	2nd AF Amplifier-Phase Inverter	6SN7GT	6SN7GT	8BD	
V3	Power Output	807	807		
V4	Power Output	807	807		
V5	Rectifier	5Y3GT	5Y3GT	5T	
V6	Rectifier	5Y3GT	5Y3GT	5T	
V7	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MASCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	8	450		PRS450/8		BR845A		TVA-1704	Filter
C2	8	450		PRS450/8		BR845A		TVA-1704	Filter
C3	16	450		PRS450/16		BR1645A		TVA-1708	Filter
C4	50	50		PRS50/50		BR505		TVA-1308	Bias Filter
C5A	10	450		AFH4-59		UPT1145C		TVL-3776	▲ Decoupling
B	10	450							■ Decoupling
C	10	450							▲ Decoupling
C6	50	50		PRS50/50		BR505		TVA-1308	1st AF Amp. Cathode
C7	10	50		PRS50/10		BR105		TVA-1304	2nd AF Amp. Cathode †
C8	10	50		PRS50/10		BR105		TVA-1304	Phase Inv. Cathode †
C9	.01	600		P688-01	D6-L03	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C10	50			SI50	D6-500	5W5Q5	GP1K-500	5GA-Q5	1st AF Amp. Grid
C11	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C12	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling ¶
C13	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Audio Coupling ‡
C14	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Line Filter *
C15	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Fixed Trimmer
C16	50			SI50	D6-500	5W5Q5	GP1K-500	5GA-Q5	2nd AF Amp. Grid *

* Not used in all models.
† Some models use 50MFD in this application.
‡ Some models use .05MFD in this application.
¶ Some models use .1MFd in this application.

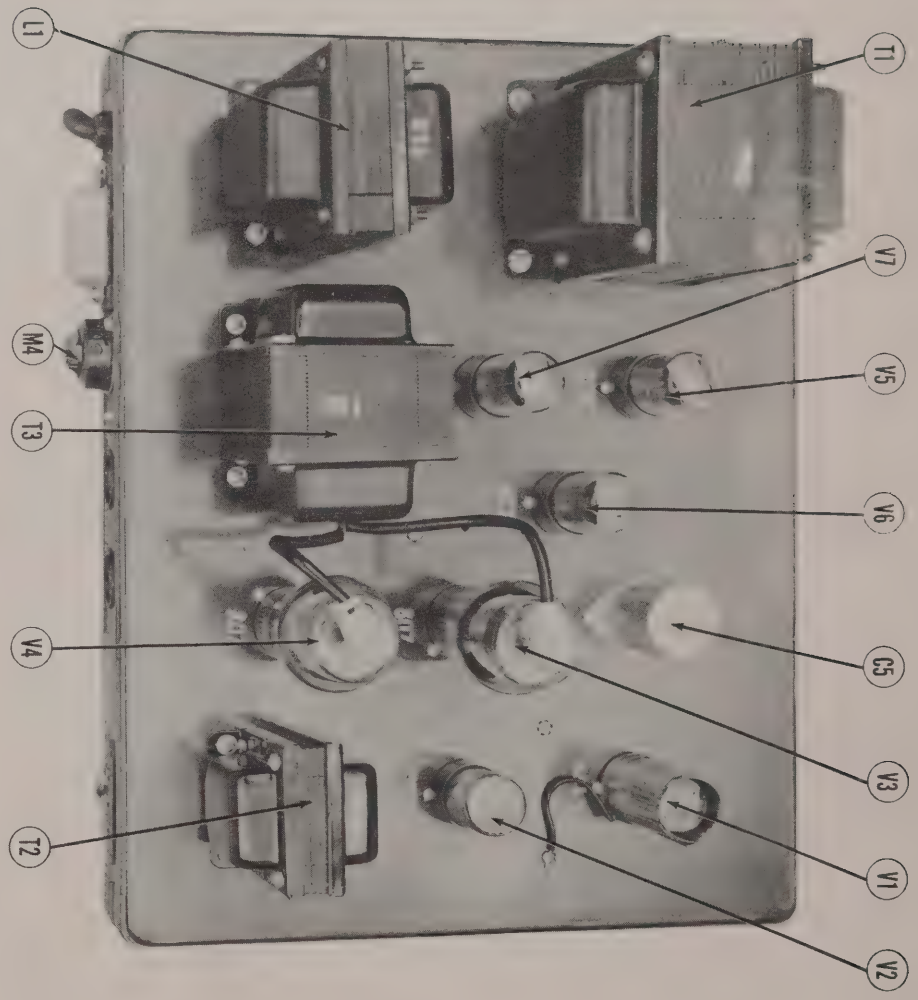
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MASCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	33-010-188	Q13-133	AM-60-Z	B-60	Volume Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R1A Per Instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MASCO PART No.	IRC PART No.	IDENTIFICATION CODES
R2	270Ω	1/2		BTS-270	Input Shunt
R3	270Ω	1/2		BTS-270	Input Shunt
R4	2200Ω	1/2		BTS-2200	1st AF Amp. Cathode
R5	27KΩ	1/2		BTS-27K	1st AF Amp. Plate
R6	270KΩ	1/2		BTS-270K	1st AF Amp. Decoupling
R7	270KΩ	1/2		BTS-270K	1st AF Amp. Grid
R8	470Ω	1/2		BTS-470	1st AF Amp. Cathode
R9	10KΩ	1/2		BTS-10K	1st AF Amp. Cathode
R10	270KΩ	1/2		BTS-270K	1st AF Amp. Plate
R11	1Meg	1/2		BTS-1Meg	2nd AF Amp. Grid
R12	1500Ω	1/2		BTS-1500	2nd AF Amp. Cathode
R13	10KΩ	1/2		BTS-10K	2nd AF Amp. Plate
R14	1Meg	1/2		BTS-1Meg	Phase Inv. Grid
R15	1500Ω	1/2		BTS-1500	Phase Inv. Cathode
R16	10KΩ	1/2		BTS-10K	Phase Inv. Plate
R17	47KΩ	1/2		BTS-47K	Decoupling
R18	20KΩ	25		2 1/2 DA-20K	Bleeder-Wire Wound
R19	20KΩ	25		2 1/2 DA-20K	Bleeder-Wire Wound
R20	10KΩ	20		2 D-10K	Bleeder-Wire Wound

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

R21	1000Ω	10		1 3/4-AA-1000	Bias Network-Adjustable-Wire Wound
R22	100KΩ			BTS-100K	Feedback
R23	18Ω				Parasitic Suppressor-See Note
R24	18Ω				Parasitic Suppressor-See Note

Note Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MASCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @1.3A	1120VCT .120ADC	560VCT .050ADC	5VAC @ 2A SEC. 4 5VAC @ 4A SEC. 5 6.3VAC @ 2.7A	P60			

(DRIVER) CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ↺)	MASCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
T2	.0075A	130ΩCT	11Henry CT	C-60				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE PRI.	IMPEDANCE SEC.	DC RES. PRI.	DC RES. SEC.	MASCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
T3	2.5KΩ CT	15Ω Tap 4&8Ω SEC. 2 500Ω Taps 70V& 140Ω	67ΩCT	.4Ω Taps .2&.3Ω 8.5Ω Taps 3Ω& 7.5Ω	T60			BO-11 ②	② Drill new mounting holes.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ↺)	MASCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.075A	114Ω	6.2 Henry	C-235	C-1001	C-2993	R-1365①	
L2	.130A	70Ω	4.5 Henry	C-575	C-1411 ①	C-3196	R-7150 ①	

① Drill new mounting holes.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			MASCO PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG	3Amp.			312003	351009	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					MASCO PART No.		
M2	Bayonet	6-8	.15	Brown			Type # 47

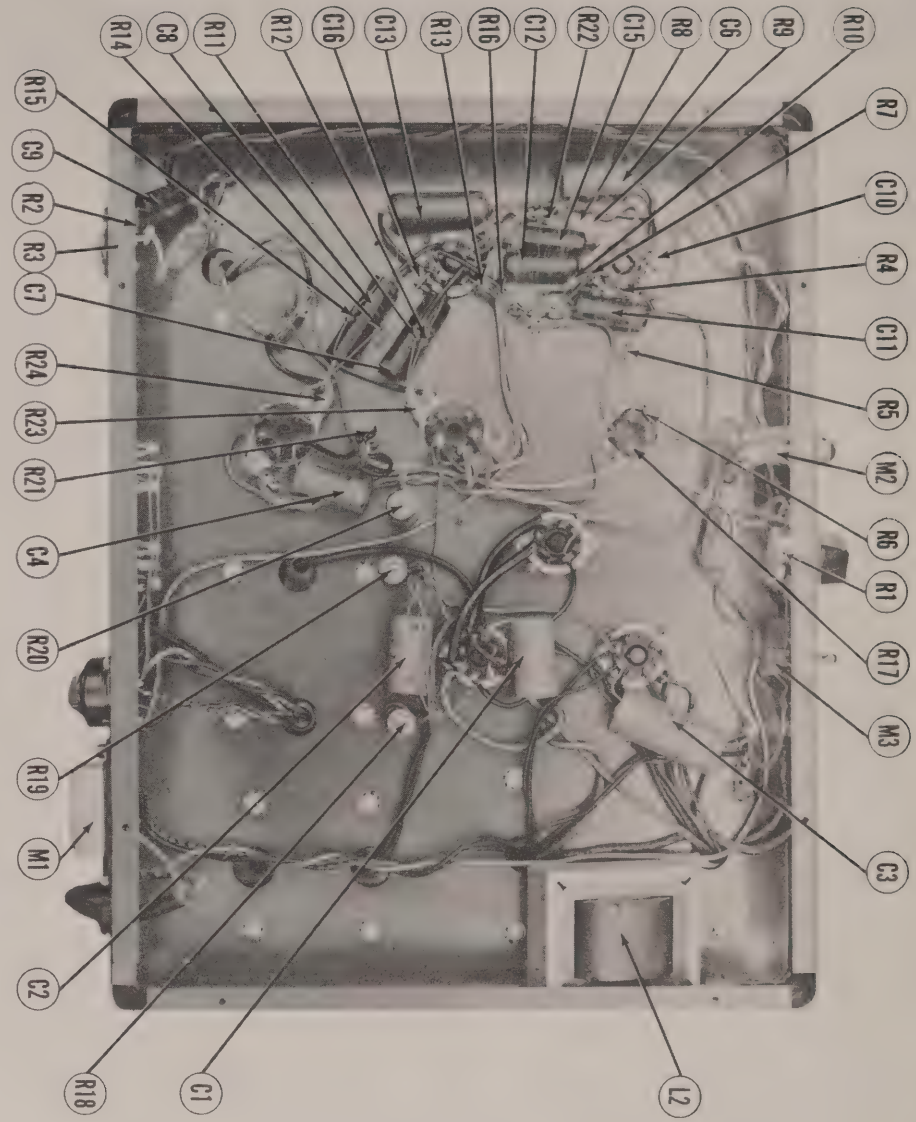
MISCELLANEOUS

ITEM No.	PART NAME	MASCO PART No.	NOTES
M3	Switch		On/Off
M4	Switch		Impedance Selector

SET 148

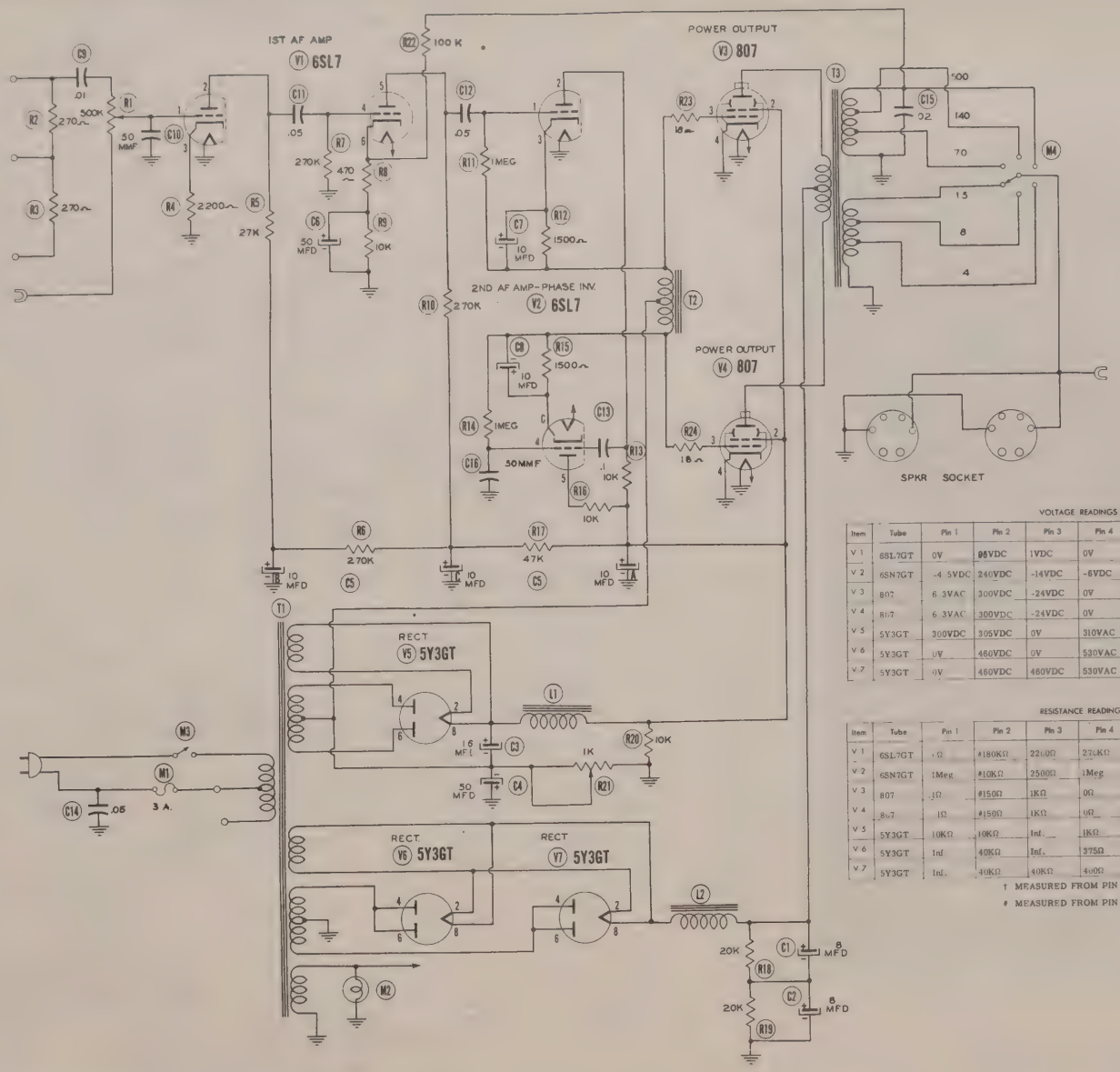
FOLDER 10

CHASSIS—BOTTOM VIEW



MASCO MODEL MB-60

MASCO MODEL MB-60



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SL7GT	0V	95VDC	1VDC	0V	170VDC	2.5VDC	6.3VAC	0V
V 2	6SN7GT	-4.5VDC	240VDC	-14VDC	-6VDC	240VDC	-14VDC	6.3VAC	0V
V 3	807	6.3VAC	300VDC	-24VDC	0V	0V	Top Cap 310VDC		
V 4	807	6.3VAC	300VDC	-24VDC	0V	0V	Top Cap 310VDC		
V 5	5Y3GT	300VDC	305VDC	0V	310VAC	0V	310VAC	0V	305VDC
V 6	5Y3GT	0V	460VDC	0V	530VAC	0V	530VAC	0V	460VDC
V 7	5Y3GT	0V	460VDC	460VDC	530VAC	460VDC	530VAC	230VDC	460VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SL7GT	0Ω	#180KΩ	220Ω	270KΩ	#400K	10KΩ	1Ω	0Ω
V 2	6SN7GT	1Meg	#10KΩ	2500Ω	1Meg	#10KΩ	2500Ω	1Ω	0Ω
V 3	807	1Ω	#150Ω	1KΩ	0Ω	0Ω	Top Cap ‡100Ω		
V 4	807	1Ω	#150Ω	1KΩ	0Ω	0Ω	Top Cap ‡100Ω		
V 5	5Y3GT	10KΩ	10KΩ	Inf.	1KΩ	Inf.	1KΩ	Inf.	10KΩ
V 6	5Y3GT	Inf.	40KΩ	Inf.	375Ω	Inf.	375Ω	Inf.	40KΩ
V 7	5Y3GT	Inf.	40KΩ	40KΩ	400Ω	40KΩ	400Ω	20K	40KΩ

‡ MEASURED FROM PIN 8 OF V6.

MEASURED FROM PIN 8 OF V5.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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148-10

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

PHOTOFACT* Folder

MECK MODELS JM717C, T, JM720C, T, 614C, TL, 617C, TL

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MODEL JM720C

MECK MODELS JM717C, T, JM720C, T, 614C, TL, 617C, TL

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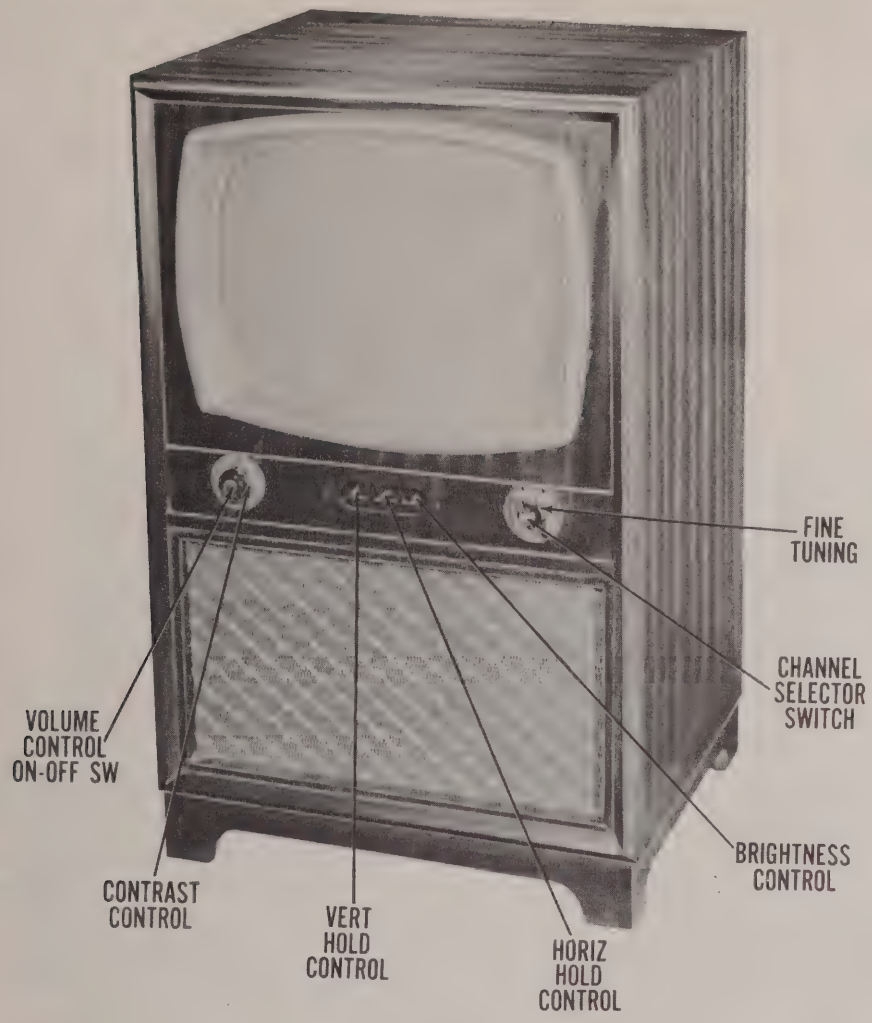
DATE 10-51 SET 148 FOLDER 11

PHOTOFACT* Folder
*TRADE MARK

MECK MODELS JM717C, T, JM720C, T, 614C, TL, 617C, TL



MECK MODELS JM717C, T, JM720C, T, 614C, TL, 617C, TL

MECK MODEL JM-720C

TRADE NAME	Meck, Models JM-717C, T (Ch. 9021), JM-720C, T (Ch. 9023), 614C, TL, 617C TL (Ch. 9022)
MANUFACTURER	John Meck Industries, Plymouth, Ind.
TYPE SET	Television Receiver
TUBES	Twenty one
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.8Amp. at 117 Volts AC
TUNING RANGE	-CHANNELS 2 thru 13

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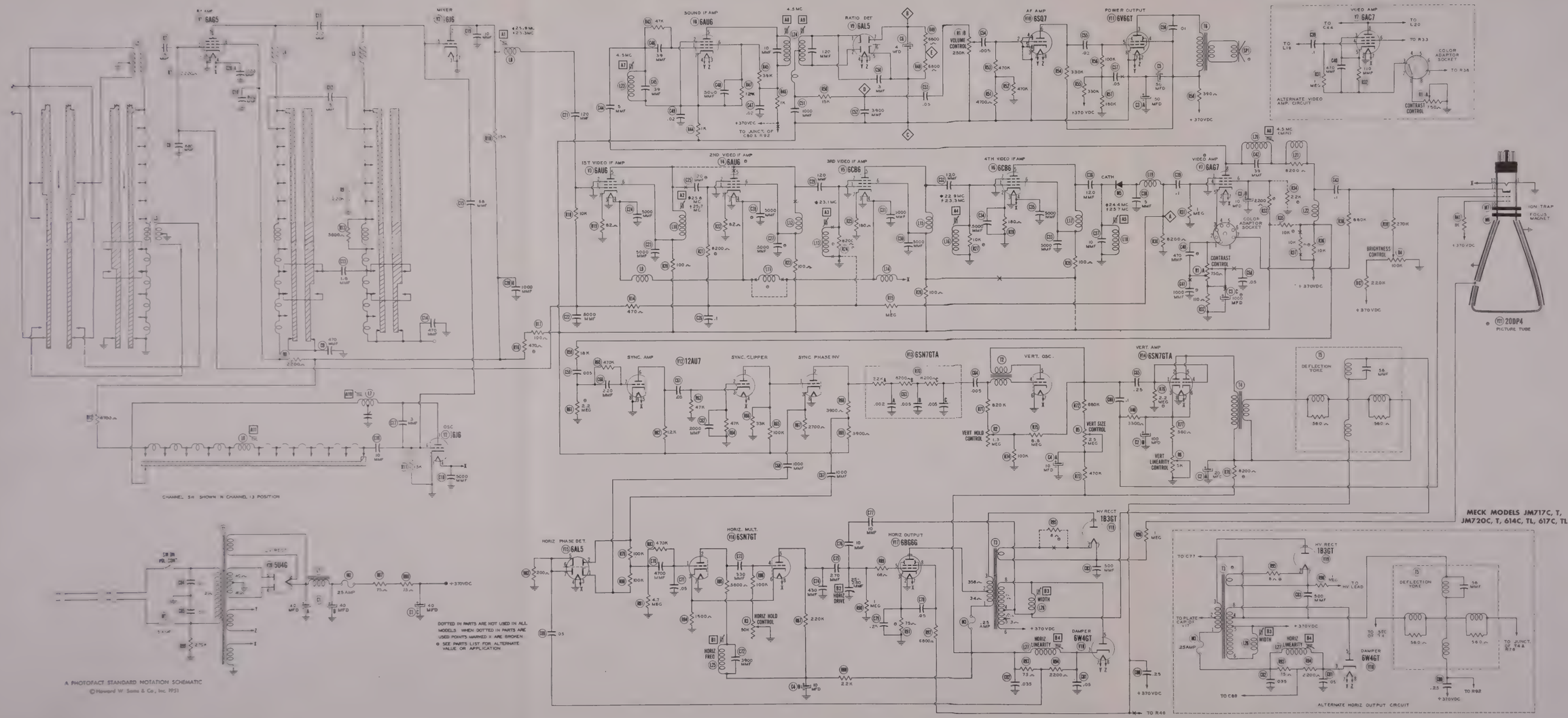
DATE 10 - 51 SET 148 FOLDER 11



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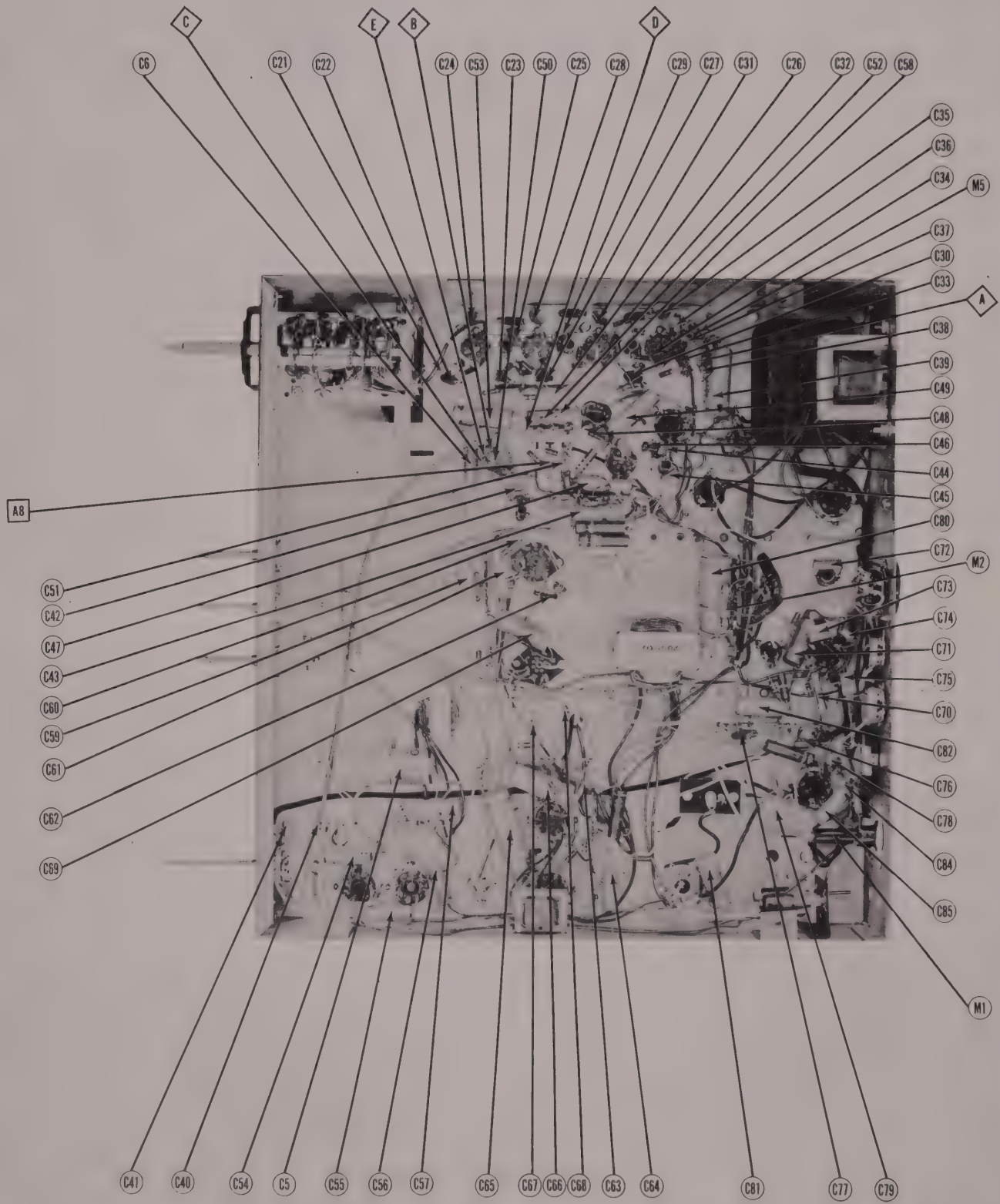
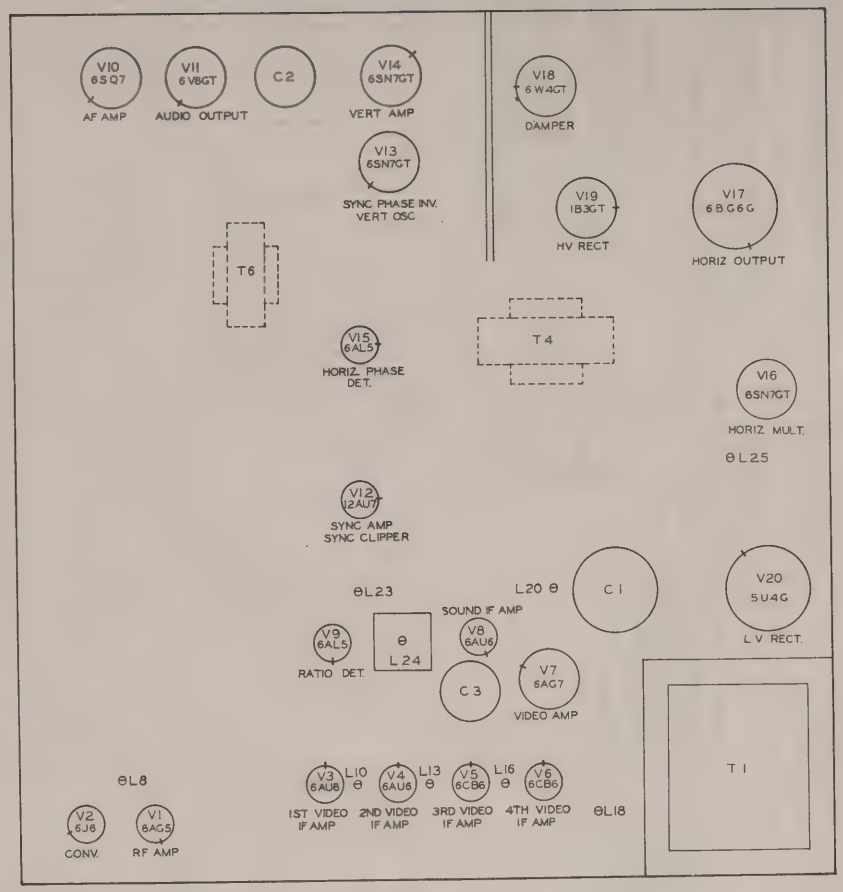
MECK MODELS JM717C, T, JM720C, T, 614C, TL, 617C, TL

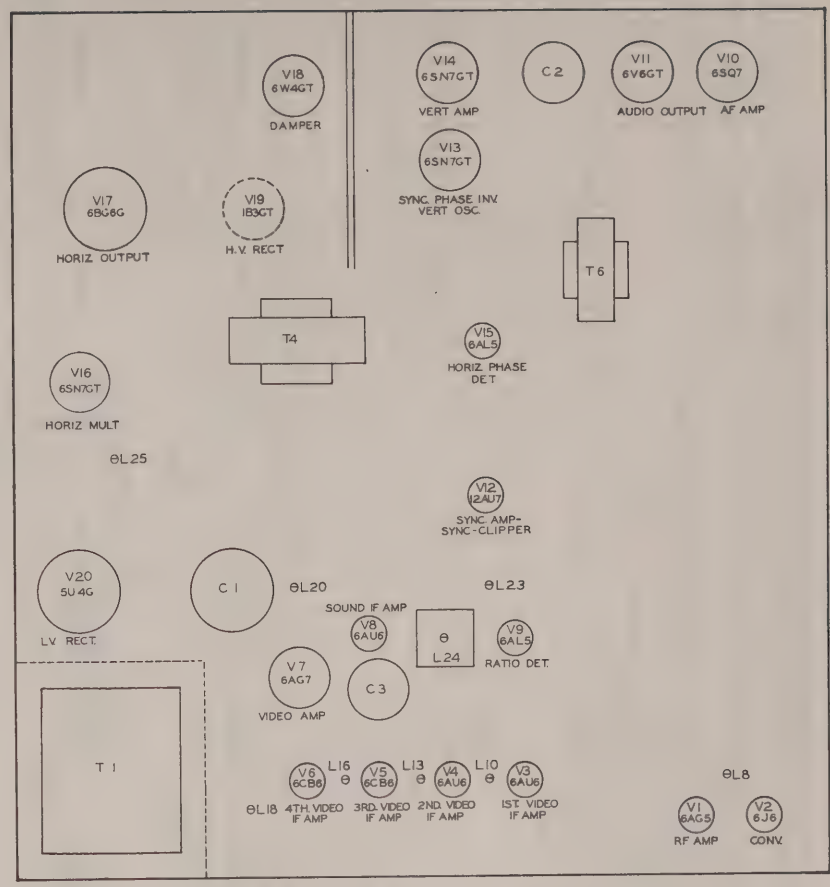
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, (V16), from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube, (V2), from its socket and replace it with a 6J6 which has pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.
Chassis # 9022 has only three video IF stages, and therefore only four adjustments. The IF coils are tuned to frequencies different from the coils in the chassis using four IF stages. The alignment frequencies for the four stage chassis will be indicated in the table by an asterisk (*). The alignment frequencies for the 9022 chassis, (three stage), will be indicated by a dagger, (†).

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	*25.9MC †23.3MC	Any	DC Probe to Point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	*25.6MC †25.7MC	"	"	A2	"
3.	"	"	*23.1MC	"	"	A3	Adjust for maximum deflection. Chassis 9022 does not have this adjustment.
4.	"	"	*22.9MC †23.3MC	"	"	A4	Adjust for maximum deflection.
5.	"	"	*24.4MC †25.7MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	25MC (10MC SWP)	21.6MC 26.1MC	Any	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to fig. 1. If necessary retouch A1 thru A5 for proper response.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD.	High side to pin 4, (Grid) of 6AC7, (V7). Low side to chassis.	Not used.	4.5MC (400∿ Mod.)	Any	Vert. Amp. thru 22KΩ to pin 11 of picture tube. Low side to chassis.	A6	Adjust for MINIMUM 400∿ indication on scope.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

During sound IF alignment the common lead of the VTVM is connected to approximately 140 volts with respect to chassis. Avoid touching or grounding the VTVM case.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01MFD.	High side to pin 4, (Grid) of 6AC7, (V7). Low side to chassis.	4.5MC (unmod.)	Any	DC Probe to Point (B). Common to Point (C).	A7, A8	Adjust for maximum deflection.
9.	"	"	"	"	DC Probe to Point (D). Common to Point (E).	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.01MFD.	High side to pin 4, (Grid) of 6AC7, (V7). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. to Point (B). Low side to chassis.	A7, A8	Disconnect stabilizer capacitor C6. Adjust for maximum amplitude and symmetry as per fig. 2.
9.	"	"	"	"	"	Vert. Amp. to Point (D). Low side to chassis.	A9	Reconnect capacitor C6. Adjust A9 so 4.5MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

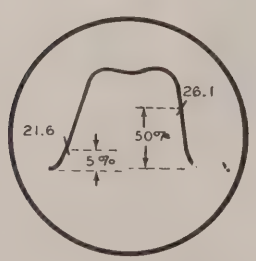


FIG. 1

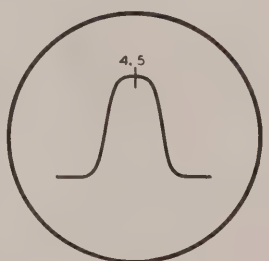


FIG. 2

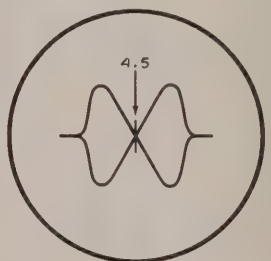


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point (A). Low side to chassis.	A10	Adjust to place sound marker at 50% as shown in fig. 4. The video marker should be at 50%.
11.	"	"	207MC (10MC SWP)	205.25MC 209.75MC	12	"		Check all high band channels to see that the markers can be properly placed well within the range of the fine tuning control. If not make compromise adjustment of A10.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
12.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A11	Adjust to place sound marker at 5% as shown in fig. 4. The video marker should be at 50%.
13.	"	"	79MC (10MC SWP)	77.25MC 81.75MC	5	"		Check all low band channels to see that the markers can be properly placed well within the range of the fine tuning control. If not make compromise adjustment of A11.
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 67.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

THE RF AND MIXER PORTION OF THIS TUNER HAS BEEN PROPERLY ALIGNED AT THE FACTORY AND IS VERY STABLE. ALIGNMENT OF THIS PORTION SHOULD NOT BE REQUIRED IN THE FIELD.

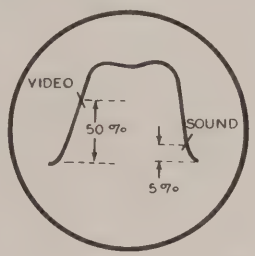


FIG. 4

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.7VDC	0V	0V	6.3VAC	110VDC	110VDC	0V		
V 2	6J6	95VDC	85VDC	0V	6.3VAC	-1.5VDC	§-4.4VDC	0V		
V 3	6AU6	-.5VDC	0V	0V	6.3VAC	135VDC	135VDC	.8VDC		
V 4	6AU6	-.5VDC	0V	0V	6.3VAC	135VDC	135VDC	.8VDC		
V 5	6CB6	0V	1.9VDC	0V	6.3VAC	135VDC	135VDC	0V		
V 6	6CB6	0V	1.9VDC	0V	6.3VAC	130VDC	130VDC	0V		
V 7	6AG7	0V	0V	0V	0V	5.7VDC	135VDC	6.3VAC	340VDC	
V 8	6AU6	¶4.7VDC	¶7.3VDC	¶6.3VAC	¶0V	¶210VDC	¶65VDC	¶7.3VDC		
V 9	6AL5	¶-.3VDC	¶-.3VDC	¶6.3VAC	¶0V	¶0V	0V	¶-.5VDC		
V 10	6SQ7	0V	¶-.6VDC	¶0V	¶0V	¶0V	¶115VDC	¶0V	¶6.3VAC	
V 11	6V6GT	0V	¶6.3VAC	¶180VDC	¶200VDC	¶-4.6VDC	0V	¶0V	140VDC	
V 12	12AU7	25VDC	0V	2.8VDC	6.3VAC	6.3VAC	85VDC	-1.7VDC	0V	0V
V 13	6SN7GT	§25VDC	80VDC	26VDC	§-20VDC §-35VDC	100VDC 210VDC	0V	6.3VAC	0V	
V 14	6SN7GT	0V .2VDC	370VDC 520VDC	10VDC 35VDC	0V .2VDC	370VDC 520VDC	10VDC 35VDC	6.3VAC	0V	
V 15	6AL5	6.8VDC	-9.8VDC	6.3VAC	0V	0V	0V	0V		
V 16	6SN7GT	§-.6VDC §3VDC	320VDC	14VDC	§-9VDC §-12VDC	110VDC	14VDC	0V	6.3VAC	
V 17	6BG6G	0V	0V	8.5VDC	0V	-.7VDC -2.7VDC	0V	6.3VAC	300VDC	Top Cap *
V 18	6W4GT	0V	0V	560VDC	0V	360VDC	0V	¶0V	¶6.3VAC	
V 19	1B3GT	* DO NOT MEASURE								Top Cap *
V 20	5U4G	0V	400VDC	0V	360VAC	0V	360VAC	0V	400VDC	
V 21	20DP4	0V	13VDC 28VDC	Pin 10 370VDC	Pin 11 0V 120VDC	Pin 12 6.3VAC				

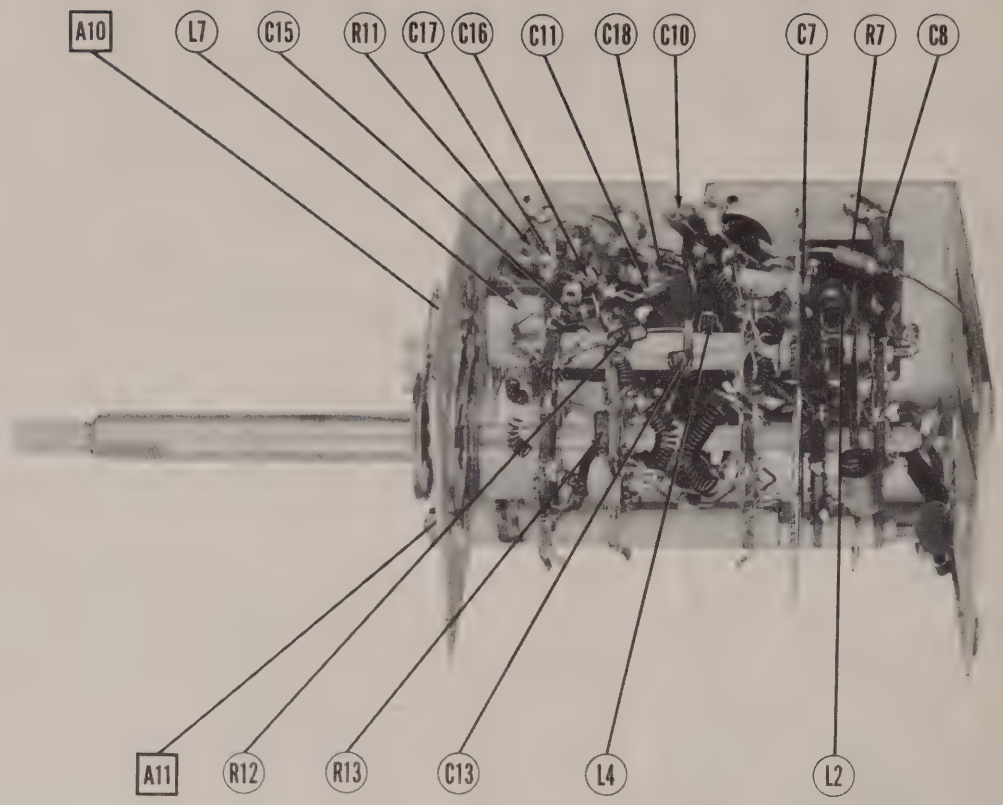
ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED.
¶ MEASURED FROM PIN 8 OF V11.
* DO NOT MEASURE.
§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

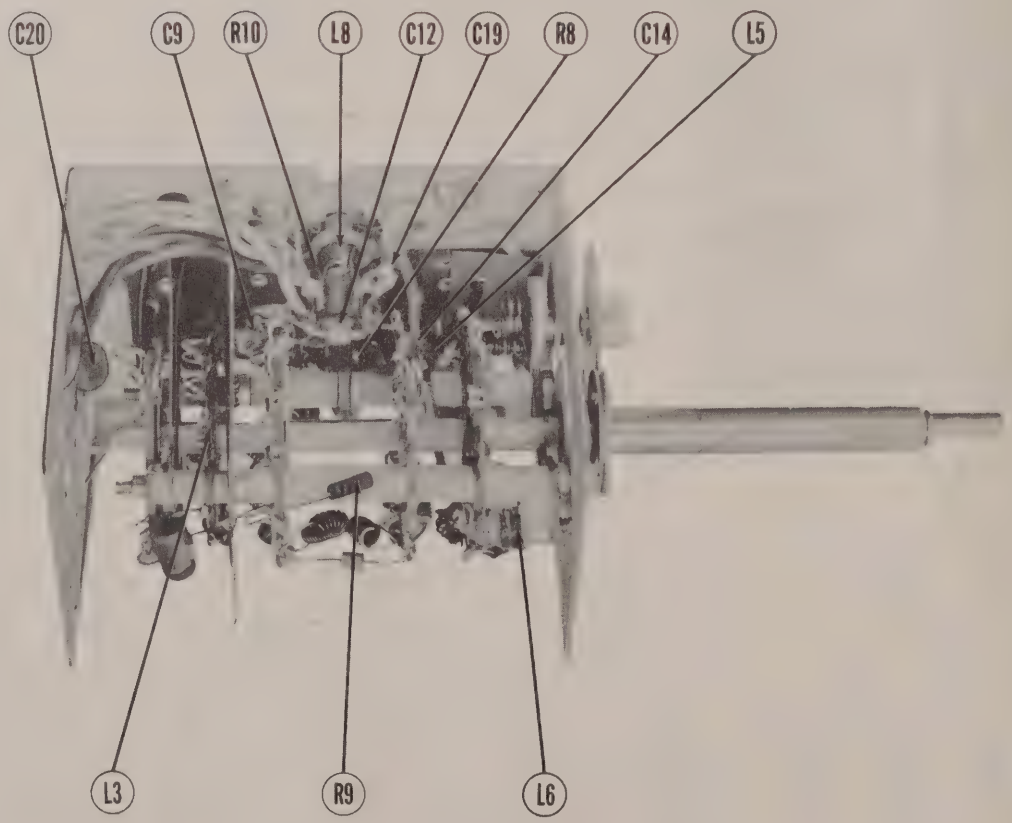
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	1Meg	0Ω	0Ω	.1Ω	¶2.8KΩ	¶2.8KΩ	0Ω		
V 2	6J6	¶5.2KΩ	¶15KΩ	0Ω	.1Ω	220KΩ	15KΩ	0Ω		
V 3	6AU6	1Meg	0Ω	0Ω	.1Ω	¶100Ω	¶100Ω	82Ω		
V 4	6AU6	1Meg	0Ω	0Ω	.1Ω	¶100Ω	¶100Ω	82Ω		
V 5	6CB6	.1Ω	180Ω	0Ω	.1Ω	¶100Ω	¶100Ω	0Ω		
V 6	6CB6	.1Ω	180Ω	0Ω	.1Ω	¶200Ω	¶200Ω	0Ω		
V 7	6AG7	0Ω	0Ω	0Ω	1Meg	850Ω	¶2.2KΩ	.1Ω	†5KΩ	
V 8	6AU6	¶48KΩ	¶1KΩ	¶.1Ω	¶0Ω	†1.1KΩ	¶13KΩ	¶1KΩ		
V 9	6AL5	Inf.	Inf.	¶.1Ω	¶0Ω	¶0Ω	Inf.	¶13KΩ		
V 10	6SQ7	0Ω	¶500KΩ	¶0Ω	¶0Ω	¶0Ω	†330KΩ	¶0Ω	¶.1Ω	
V 11	6V6GT	Inf.	¶.1Ω	†940Ω	†540Ω	280KΩ	Inf.	¶0Ω	30KΩ	
V 12	12AU7	¶40KΩ	47KΩ	47KΩ	.1Ω	.1Ω	¶12KΩ	2.6Meg	0Ω	0Ω
V 13	6SN7GT	28KΩ	¶7.8KΩ	2.7KΩ	2.2Meg 920KΩ	#2.8Meg #1.1Meg	0Ω	.1Ω	0Ω	
V 14	6SN7GT	2.2Meg	#9KΩ	5.5KΩ 560Ω	2.2Meg	#9KΩ	5.5KΩ 560Ω	.1Ω	0Ω	
V 15	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	200Ω	Inf.	200Ω		
V 16	6SN7GT	5.1Meg	#27KΩ	1.5KΩ	150KΩ 100KΩ	#240KΩ	1.5KΩ	0Ω	.1Ω	
V 17	6BG6G	Inf.	0Ω	75Ω	Inf.	1Meg	Inf.	.1Ω	†6.8KΩ	Top Cap #65Ω
V 18	6W4GT	Inf.	Inf.	600KΩ	Inf.	†200Ω	Inf.	¶0Ω	¶.1Ω	
V 19	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								Top Cap #400Ω
V 20	5U4G	Inf.	60KΩ	Inf.	40Ω	Inf.	40Ω	Inf.	60KΩ	
V 21	DP4	0Ω	8.8KΩ 8.8KΩ	Pin 10 †1.1KΩ	Pin 11 †440KΩ †380KΩ	Pin 12 .1Ω				

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED.
† MEASURED FROM PIN 2 OF V20.
# MEASURED FROM PIN 3 OF V18.
¶ MEASURED FROM PIN 8 OF V11.

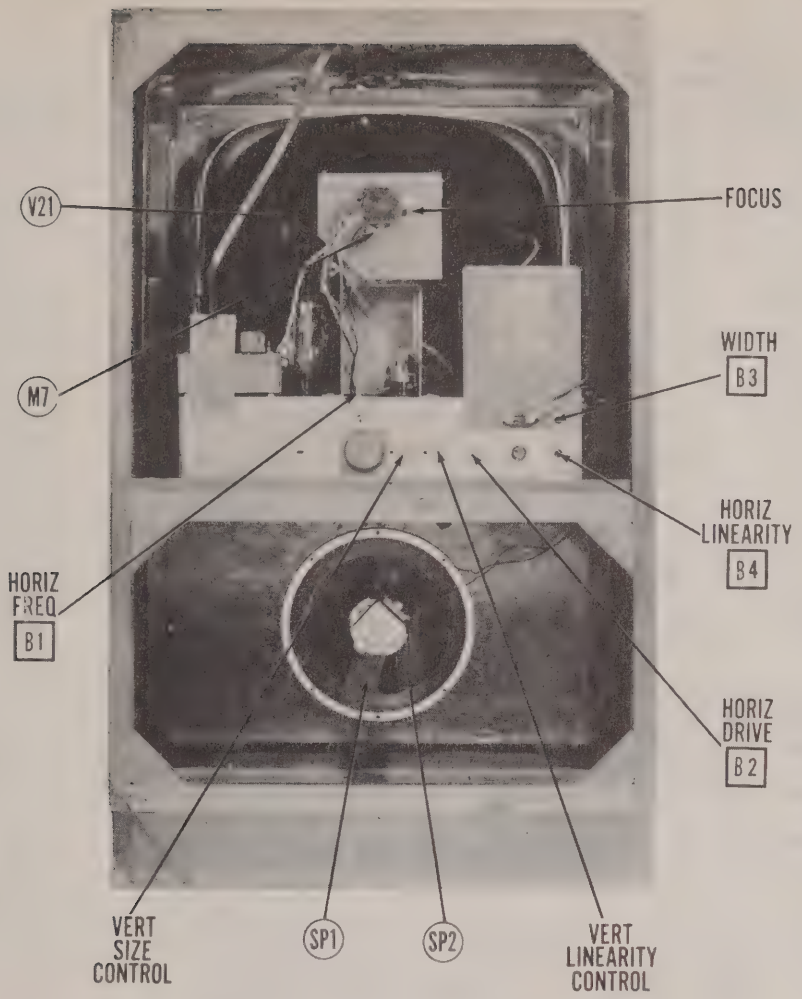
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET–REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug, (B1), until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer, (B2), counter-clockwise as far as possible without crowding or bright vertical lines appearing in the picture.

Adjust the width slug (B3), until the picture is slightly wider than necessary to fill the mask horizontally.

Adjust the horizontal linearity slug, (B4), until the picture is symmetrical from left to right.

Since the drive, width, and linearity adjustments are interacting, it may be necessary to adjust them alternately to obtain optimum results.

If the oscillator falls out of synchronization during any of the above adjustments, readjust B1.

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove eight wood screws from rear cover. Remove rear cover.
3. Disconnect built-in antenna.
4. Disconnect speaker.
5. Remove four 7/16" hex head bolts from chassis. Remove chassis.
6. Remove two 5/16" hex nuts from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No	USE	REPLACEMENT DATA MECK PART No.	STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd Video IF Amp.	6AU6	6AU6	7BK	Not used in 9022 chassis.
V5	3rd Video IF Amp.	6CB6	6CB6	7CM	
V6	4th Video IF Amp.	6CB6	6CB6	7CM	
V7A	Video Amplifier	6AG7	6AG7	8Y	
B	Video Amplifier	6AC7	6AC7	8N	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Detector	6AL5	6AL5	6BT	
V10	AF Amplifier	6SQ7	6SQ7	8Q	
V11	Power Output	6V6GT	6V6GT	7AC	
V12	Sync Amplifier Sync. Clipper	12AU7	12AU7	9A	
V13	Sync. Phase Inv Vert. Oscillator	6SN7GTA	6SN7GTA	8BD	
V14	Vert. Amplifier	6SN7GTA	6SN7GTA	8BD	
V15	Horiz. Phase Det.	6AL5	6AL5	6BT	
V16	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V17	Horiz. Output	6BT6G	[illegible]	5BT	
V18	Damper	6W4GT	6W4GT	4CG	
V19	HV Rectifier	1B3GT	1B3GT	3C	
V20	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA MECK PART No	SYLVANIA PART No.	THOMAS PART No	RTMA BASE TYPE	NOTES
V21A	20DP4	20DP4		12D	
B	17BP4A	17BP4A	17BP4	12D	
C	14CP4	14CP4	14CP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	VOLT	REPLACEMENT DATA MECK PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	CLA-10039A	AFH 3-44		UPT44445		TVL-3787	▲ Filter
B	40	450							■ Filter
C	40	450							▲ Filter
C2A	20	450	CLC-10070	AFH 2-93		UPT1150		TVA-1714	■ Vert. Amp. Dec.
B	100	25				V10		TVA-1207	▲ Vert. Amp. Cathode
C3A	50	350	CLC-10068B			UPT302		RI153	▲ Decoupling
B	10	350							■ Video Amp. Screen
C	1000	5							▲ Video Amp. Cathode † *
C4A	10	450	CLC-10069	AFH 2-47		UPT1145		TVL-2750	■ Vert. Osc. Dec.
B	10	450							▲ Horiz. MV Dec.
C5	150	350	CLA-10087A	PRS450/40		BR4035		TVA-1613	Audio Output Dec.
C6	14	50	CLA-10027	PRS150I-4		BR550		TVA-1303	Stabilizing Cap.
C7	15			SI15	D6-150		GP1K-150	5GA-Q15	RF Coupling
C8	680			SI680	D6-681		GP2K-681	5GA-T68	AGC Filter
C9	470			SI470	D6-471		GP2K-471	5GA-T47	RF Amp. Plate
C10	800			BPD-0008	DD-801				RF Amp. Plate
C11	2.2				TCZ-2.2		NPOK-2R2		RF Coupling
C12	.5				TCZ-.5		NPOK-R50		RF Coupling
C13	1.8						NPOK-1R8		RF Coupling
C14	470			SI470	D6-470		GP2K-471	5GA-T47	Mixer Grid Filter
C15	.68				TCZ-.68		NPOK-R68		Osc. Coupling
C16	10			SI10NPO	TCZ-10		NPOK-100	5TCC-Q1	Osc. Grid Cap.
C17	3		CC-15030				NO80-331-030		Osc. Feedback
C18	5000		CMX-10002	BPD-005	DD-502		811-005	5HK-D5	Conv. Fil.
C19	10			SI10NPO	TCZ-10		NPOK-100	5TCC-Q1	Fixed Trimmer
C20X	2000			BPD-2X001	DD-2-102		812-001	5HK-2D1	Fil. Bypass
B	1000								RF Bypass
C21	120	500	CM-15121	1468-00015	D6-121	1W5T15	GP2K-121	1FM-315	IF Coupling
C22	5000		CMX-10002	BPD-005	DD-502	1D5D5	811-005	5HK-D5	AGC Filter
C23	5000		CMX-10002	BPD-005	DD-502	1D5D5	811-005	5HK-D5	1st Video IF Dec.
C24	5000		CMX-10002	BPD-005	DD-502	1D5D5	811-005	5HK-D5	1st Video IF Fil.
C25	120	500	CM-15121	1468-00015	D6-121	1W5T15	GP2K-121	1FM-315	IF Coupling §
C26	.1	400	CP-16104	P688-1	DF-104	PTE4P1		4TM-P1	AGC Filter
C27	5000		CMX-10002	BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd Video IF Dec. §
C28	5000		CMX-10002	BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd Video IF Fil. §
C29	120	500	CM-15121	1468-00015	D6-121	1W5T15	GP2K-121	1FM-315	IF Coupling
C30	5000		CMX-10002	BPD-005	DD-502	1D5D5	811-005	5HK-D5	3rd Video IF Dec.
C31	5000		CMX-10002	BPD-005	DD-502	1D5D5	811-005	5HK-D5	3rd Video IF Fil.
C32	120	500	CM-15121	1468-00015	D6-121	1W5T15	GP2K-121	1FM-315	IF Coupling
C33	5000		CMX-10002	BPD-005	DD-502	1D5D5	811-005	5HK-D5	4th Video IF Dec.
C34	5000		CMX-10002	BPD-005	DD-502	1D5D5	811-005	5HK-D5	4th Video IF Cathode
C35	5000		CMX-10002	BPD-005	DD-502	1D5D5	811-005	5HK-D5	4th Video IF Fil.
C36	120	500	CM-15121	1468-00015	D6-121	1W5T15	GP2K-121	1FM-315	IF Coupling
C37	10		C-15100	SI10	D6-100	5W5Q1	GP1K-100	5GA-Q1	Fixed Trimmer
C38	5		CC-15050	SI5NPO	TCZ-4.7	5W5V5	NPOK-050		Video Det. Filter
C39	.1	600	CP-16104	P688-1	DF-104	PTE6P1		6TM-P1	Video Coupling
C40	470			SI470	D6-471	5W5T5	GP2K-471	5GA-T47	Video Amp. Cathode †
C41	1000		CC-15102	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	Contrast Cont. Shunt *
C42	39	500	CM-15390	1468-00004	D6-390	5W5Q4	GP1K-390	1FM-44	Fixed Trimmer
C43	.1	600	CP-16104	P688-1	DF-104	PTE6P1		6TM-P1	Video Coupling
C44	5		CC-15050	SI5	TCZ-4.7	5W5V5	GP1K-050		Sound IF Coupling
C45	39	500	CM-15390	1468-00004	D6-390	5W5Q4	GP1K-390	1FM-44	Fixed Trimmer
C46	39	500	CM-15390	1468-00004	D6-390	5W5Q4	GP1K-390	1FM-44	Sound IF Coupling
C47	.02	600	CP-16203	P688-02	DF-203	PTE6S2		6TM-S2	Sound IF Plate
C48	5000		CMZ-10002	BPD-005	DD-502	1D5D5	811-006	5HK-D5	Sound IF Screen
C49	.02	600	CP-16203	P688-02	DF-203	PTE6S2		6TM-S2	Sound IF Cathode
C50	3		CC-15030				NO80-331-030		Diode Load Cap.
C51	1000		CC-15102	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	RF Bypass
C52	3900		CC-15392	SI4000	D6-402	1D5D4	GP2-333-402	1FM-24	De-Emphasis
C53	.05	600	CP-16503	P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C54	.005	600	CP-16502	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C55	.02	600	CP-16203	P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C56	.01	600	CP-16103	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Output Plate

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	VOLT	REPLACEMENT DATA MECK PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C57	.05	600	CP-16503	P688-05	DF-503	PTE6S5		6TM-S5	Audio Output Grid *
C58	.05	600	CP-16503	P688-05	DF-503	PTE6S5		6TM-S5	RF Bypass *
C59	.005	600	CP-16502	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Sync. Coupling
C60	220	500	CM-15221	1468-00025	D6-221	1W5T25	GP2K-221	1FM-325	Sync. Coupling
C61	.05	600	CP-16503	P688-05	DF-503	PTE6S5		6TM-S5	Sync. Coupling
C62	2000		CC-15202	SI2000	D6-202	1W5D2	GP2-333-202	5HK-D2	Sync. Clipper Grid
C63A	.002			P688-002		PTE6D2	GP2-333-202		Integrator Net
B	.005		●CMX-10012	P688-005	●PC-100	PTE6D5	GP2-333-502	●10IC1	Integrator Net
C	.005			P688-005		PTE6D5	GP2-333-502		Integrator Net
C64	.005	600	CP-16502	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Vert. Osc. Grid
C65	.25	600	CP-16254	684-25		GP6P25		6TM-P25	Vert. Sweep Coupling
C66	.1	600	CP-16104	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C67	1000		CC-15102	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	Horiz. Sync. Coupling
C68	1000		CC-15102	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	Horiz. Sync. Coupling
C69	.05	600	CP-16503	P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Feedback
C70	4700			SI4700	D6-472	1D5D5	GP2-333-472	5HK-D47	AFC Filter
C71	.05	600	CP-16503	P688-05	DF-503	PTE6S5		6TM-S5	AFC Filter
C72	3900	500	CM-15392BS	1464-004		1DR5D4		MS-24	Fixed Trimmer
C73	330	500	CM-15331A	1469-00035					Horiz. MV Feedback
C74	430	500	CM-15431A						Horiz. Discharge
C75	270	500	CM-15271	1469-0003	D6-271	5W5T3	GP2K-271	MS-33	Horiz. Sweep Coupling
C76	10	1500	CMX-10010A						Horiz. Feedback
C77	10	1500	CMX-10010A						Horiz. Feedback
C78	.05	600	CP-16503	P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Output Screen
C79	.25	600	CP-16254	684-25		GP6P25		6TM-P25	Horiz. Output Cathode
C80	.25	600	CP-16254	684-25		GP6P25		6TM-P25	Horiz. Sweep Coupling
C81	.05	600	CP-16503	P688-05	DF-503	PTE6S5		6TM-S5	Damper Filter
C82	.035	600	CP-16353						Damper Filter
C83	500	20000	CCXA-10001A	HV20C	TV3-502				HV Filter
C84	.01	600	CP-16103	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Line Filter
C85	.01	600	CP-16103	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Line Filter

* Not used in all models.
† Some models use 680MMF in this application.
‡ Some models use 500MFD in this application.
● Items C63A, C63B, C63C, R70A, R70B, R70C are combined into one unit.
§ Not used in chassis 9022.

CONTROLS

ITEM No.	RATING RESISTANCE	WATTS	REPLACEMENT DATA MECK PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	750Ω	1	VC12127B		RTV-297		Contrast Control-Tapped @ 500Ω-Front
B	250KΩ	1					Volume Control and SW-Rear
R2A	1.3Meg	1/2	VC12132B	Q11-158	AG-83-S	AN-69	Vert. Hold Control
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Attach to R2A Per Instructions
R3A	50KΩ	1/2	VC12131B	Q11-123	AG-44-S	AN-31	Horiz. Hold Control
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Attach to R3A Per Instructions
R4A	100KΩ	1/2	VC12130B	Q11-128	AG-49-S	AN-40	Brightness Control
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Attach to R4A Per Instructions
R5A	2.5Meg	1/2	VC12121B	Q11-239	AG-84-S	AN-83	Vert. Size Control
B	Shaft		Not Req.	RQ	FK8-1/4	AK-1	Attach to R5A Per Instructions
R6A	500Ω	1/2	VC12120A	Q11-114	AG-19-S	AN-10	Vert. Linearity Control
B	Shaft		Not Req.	RQ	FK8-1/4	AK-1	Attach to R6A Per Instructions

RESISTORS

ITEM No.	RATING RESISTANCE	WATTS	REPLACEMENT DATA MECK PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS †10% UNLESS OTHERWISE SPECIFIED.
R7	2200Ω 20%	1		BTS-2200	RF Amp. Grid
R8	2200Ω 20%	1		BTS-2200	RF Amp. Decoupling
R9	220KΩ 20%	1		BTS-220K	Mixer Grid Coil Shunt
R10	15KΩ 20%	1		BTS-15K	Mixer Plate
R11	15KΩ 20%	1		BTS-15K	Osc. Grid
R12	470Ω 20%	1		BTS-470	Osc. Plate
R13	5600Ω	1		BTS-5600	Mixer Grid Coil Shunt
R14	470Ω	1		BTS-470	AGC Network
R15	1Meg 20%	1		BTS-1Meg.	AGC Network
R16	470Ω 20%	1		BTS-470	Decoupling-See Note 1
R17	100Ω 20%	1	RC31000	BTS-100	Decoupling
R18	10KΩ	1	RC31002A		1st Video IF Amp. Grid
R19	82Ω 20%	1	RC30820	BTS-82	1st Video IF Amp. Cathode
R20	100Ω 20%	1	RC31000	BTS-100	1st Video IF Amp. Decoupling
R21	820Ω	1	RC33820A		2nd Video IF Amp. Grid-See Note 7
R22	82Ω 20%	1	RC30820	BTS-82	2nd Video IF Amp. Cathode-See Note 7
R23	100Ω 20%	1	RC31000	BTS-100	2nd Video IF Amp. Decoupling-See Note 7
R24	820Ω	1	RC33820A		3rd Video IF Amp. Transformer Shunt-See Note 8
R25	180Ω 20%	1	RC31800	BTS-180	3rd Video IF Amp. Cathode
R26	100Ω 20%	1	RC31000	BTS-100	3rd Video IF Amp. Decoupling
R27	10KΩ	1	RC31002A		4th Video IF Transformer Shunt-See Note 9
R28	180Ω 20%	1	RC31800	BTS-180	4th Video IF Amp. Cathode
R29	100Ω 20%	1	RC31000	BTS-100	4th Video IF Amp. Decoupling
R30	820Ω	1	RC33820A	BTS-8200	Video Det. Diode Load
R31	1Meg. 20%	1	RC31004	BTS-1Meg	Video Amp. Grid
R32	110Ω 5%	1	RC31100B		Video Amp. Cathode
R33	2200Ω	1	RC32201	BTS-2200	Video Amp. Screen-See Note 3
R34	22KΩ	1	RC42302	BTA-22K	Voltage Divider-See Note 1
R35	10KΩ	1	RC31002A	BTS-10K	Voltage Divider-See Note 1
R36	10KΩ 20%	2	RC51002	BTB-10K	Video Amp. Plate-See Note 2
R37	10KΩ 20%	2	RC51003	BTB-10K	Video Amp. Plate-See Note 2
R38	68KΩ 20%	2	RC36803	BTS-680K	Picture Tube Cathode
R39	270KΩ 20%	2	RC32703	BTS-270K	Picture Tube Cathode
R40	3300Ω 20%	1	RC33301	BTS-3300	Picture Tube Grid
R41	1000Ω	1	RC31001	BTS-1000	ACC Anode Load
R4	220KΩ 20%	1	RC32203	BTS-220K	Voltage Divider
R43	47KΩ 20%	1	RC34703	BTS-47K	Sound IF Amp. Grid
R44	1000Ω 20%	1	RC31001	BTS-1000	Sound IF Amp. Cathode
R45	39KΩ 20%	1	RC43902	BTA-39K	Sound IF Amp. Screen
R46	1000Ω 20%	1	RC31001	BTS-1000	Sound IF Amp. Decoupling
R47	12KΩ 20%	1	RC31202	BTS-12K	Voltage Divider
R48	6800Ω	1	RC36801A	BTS-6800	Ratio Det. Diode Load
R49	6800Ω	1	RC36801A	BTS-6800	Ratio Det. Diode Load
R50	15KΩ 20%	1	RC31502	BTS-15K	De-Emphasis
R51	4700Ω	1	RC34701	BTS-4700	Bias Network
R52	470KΩ 20%	1	RC34703	BTS-470K	AF Amp. Grid
R53	470KΩ 20%	1	RC34703	BTS-470K	AF Amp. Grid

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	WATTS	REPLACEMENT DATA MECK PART No.	IRC PART No.	IDENTIFICATION CODES
R54	330KΩ 20%	1	RC33303	BTS-330K	AF Amp. Plate
R55	330KΩ 5%	1	RC33303B	BTS-330K 5%	Bias Network
R56	100KΩ 20%	1	RC31003	BTS-100K	Output Grid
R57	180KΩ 5%	1	RC31803B	BTS-180K 5%	Output Grid
R58	390Ω 20%	1		BTA-390	Decoupling
R59	18KΩ	1	RC31802	BTS-18K	Isolation
R60	470KΩ 20%	1	RC34703	BTS-470K	Sync. Amp. Grid
R61	2.2Meg	1	RC32204	BTS-2.2Meg	Sync. Amp. Grid-See Note 6
R62	12KΩ 20%	1	RC31202	BTS-12K	Sync. Amp. Plate
R63	47KΩ 20%	1	RC34702	BTS-47K	Sync. Clipper Grid
R64	47KΩ 20%	1	RC34702	BTS-47K	Sync. Clipper Cathode
R65	100KΩ 20%	1	RC31003	BTS-100K	Sync. Clipper Plate
R66	33KΩ 20%	1	RC33302	BTS-33K	Voltage Divider
R67	2700Ω	1	RC32701A	BTS-2700	Sync. Phase Inv. Cathode
R68	3900Ω 20%	1	RC33901	BTS-3900	Sync. Phase Inv. Plate
R69	3900Ω 20%	1	RC33901	BTS-3900	Sync. Phase Inv. Plate
R70A	22KΩ	1	CMX-10012 ●	BTS-22K	Integrator
B	8200Ω	1		BTS-8200	Integrator
C	8200Ω	1		BTS-8200	Integrator
R71	820KΩ	1		BTS-820K	Vert. Osc. Grid
R72	680KΩ 20%	1	RC36803	BTS-680K	Vert. Osc. Plate
R73	470KΩ 20%	1	RC34703	BTS-470K	Vert. Osc. Decoupling
R74	100KΩ 20%	1	RC31003	BTS-100K	Voltage Divider
R75	6.8Meg 20%	1	RC36804	BTS-6.8Meg	Voltage Divider
R76	2.2Meg 20%	1	RC32204	BTS-2.2Meg	Vert. Output Grid-See Note 6
R77	560Ω 20%	1	RC35600	BTS-560	Vert. Output Cathode
R78	8200Ω	2		BTB-8200	Vert. Output Decoupling-See Note 4
R79	100KΩ20%	1	RC31003	BTS-100K	Horiz. Phase Det. Diode Load
R80	100KΩ 20%	1	RC31003	BTS-100K	Horiz. Phase Det. Diode Load
R81	4.7Meg 20%	1	RC34704	BTS-4.7Meg	Horiz. Phase Det. Diode Load
R82	200Ω 5%	2	RC32000B		Horiz. Feedback
R83	470KΩ 20%	1	RC34703	BTS-470K	Horiz. AFC Filter
R84	1500Ω 20%	1	RC31501	BTS-1500	Horiz. MV Cathode
R85	5600Ω 20%	1	RC35601	BTS-5600	Horiz. MV Plate
R86	100KΩ 20%	1	RC31003	BTS-100K	Horiz. MV Grid
R87	220KΩ	1	RC32202	BTS-220K	Horiz. MV Plate
R88	22KΩ 20%	1	RC42202	BTA-22K	Horiz. MV Decoupling
R89	68Ω 20%	1	RC30680		Parasitic Suppressor
R90	1Meg 20%	1	RC31004	BTS-1Meg	Horiz. Output Grid
R91	75Ω	2	RC40820	BW-2-75	Horiz. Output Cathode-Wire Wound-See Note 5
R92	6800Ω 20%	2	RC36803	BTB-6800	Horiz. Output Screen
R93	75Ω 5%	1	RC30750B		Horiz. Linearity Coil Shunt
R94	2200Ω 20%	1	RC32201	BTS-2200	Horiz. Linearity Coil Shunt
R95	8Ω 5%	1	RC30080B		HV Rectifier Filament-See Note 1
R96	1Meg 20%	1	RC41004		HV Filter
R97	75Ω	5		1 3/4 A-75	Filter-Wire Wound
R98	75Ω	5		1 3/4 A-75	Filter-Wire Wound
R99	270KΩ 20%	1	RC42703	BTA-270K	Isolation

● Items R70A, R70B, R70C, C63A, C63B, and C63C are combined into one unit.
Note 1 Not used in all models.
Note 2 Some models may use single 11KΩ 4 watt resistor in this application.
Note 3 Some models use 23KΩ 4 watt resistor in this application.
Note 4 Some models use 5600Ω resistor in this application.
Note 5 Some models use 82Ω resistor in this application.
Note 6 Some models use series resistors in this application to obtain desired value.
Note 7 Not used in chassis 9022.
Note 8 Chassis 9022 uses 22KΩ in this application.
Note 9 Chassis 9022 uses 3.3KΩ in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA MECK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC	760VCT	5VAC	6.3VAC	TPC-10004A		P-3059	
	@ 1.8A	.220ADC	@ 3A	@ 2.6A				
				SEC. 4				
				6.3VAC				

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	SEC.	REPLACEMENT DATA MECK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	165Ω	940Ω	T0A-10051A	A-8111 ④	A-3000 ④	TBO-1 ④	Vert. block osc. trans.
T3	390Ω	20Ω	THC-10002 ⑤		HVO-7		Horiz. output trans.
	Tap 34Ω	Tap 3Ω & 13Ω	THC-10000 ⑥				
		SEC. 2					
		0Ω					
T4	830Ω	13Ω	TOB-10045C	A-8112 ④	A-3036 ④	TSO-5 ④	Vert. output trans.
T5A	13Ω		YDB-10000A	DY-7	MDF-70		Horiz. Deflection coils.
B	62Ω						Vert. Deflection coils.

④ Drill one new mounting hole.
⑤ Used with 20" tubes.
⑥ Used with 14", 16", 17" tubes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	SEC.	DC RES. PRI.	SEC.	REPLACEMENT DATA MECK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T6	3.7KΩ	3.7Ω	400Ω	.8Ω	TOC-10031B	A-3823 ④	A-3930	RO-9 ④	

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	MECK PART No.	VIKING PART No.	QUAM PART No.	
SP1A	PM	3.7Ω	SRC-10024①	10J12	10A4A	① Used in model 720C.
B	PM	3.7Ω	SRC-10025②	8JA	8A31	② Used in model 717C and 720T
C	PM	3.7Ω	SRC-10026 ③	5J4	5A1	③ Used in model 717T and 614T
	CONE DIA.	V. C. DIA.				
SP2A	10"	1"				
B	8"	1"				
C	5"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	MECK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.220A	33Ω	1 Henry	LGA-10021A	C-2326 ④	C-2996④	TR3300④	

④ Drill one new mounting hole.

COILS (RF-IF)

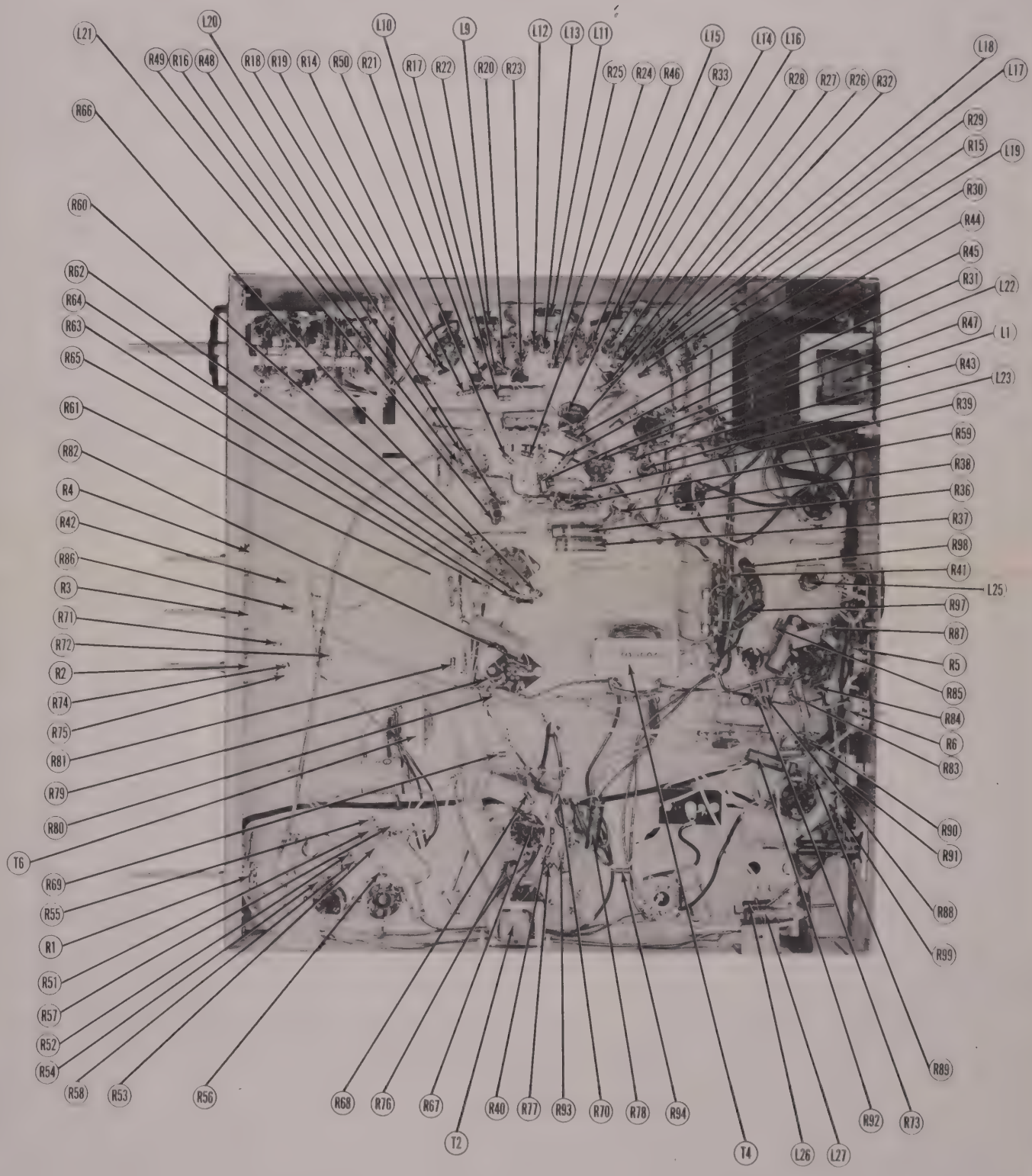
ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	MECK PART No.		IRC PART No.	
L2	Ant. Coil	0Ω	0Ω				Part of tuner Part #JTA-10007B
L3	Ant. Coil	0Ω	0Ω				Part of tuner Part #JTA-10007B
L4	RF Coil	0Ω					Part of tuner Part # JTA-10007B
L5	Mixer Grid Coil	0Ω					Part of tuner Part #JTA-10007B
L6	Osc. Coil	0Ω					Part of tuner Part #JTA-10007B
L7	Osc. Coil	0Ω					Part of tuner Part #JTA-10007B
L8	1st Video IF	.5Ω					Part of tuner Part #JTA-10007B
L9	Fil. Choke	0Ω		LGA-10019A			
L10	2nd Video IF	.1Ω		TSA-10030B			
L11	Fil. Choke	0Ω		LGA-10019A			Not used in chassis 9022.
L12	RF Choke	4Ω		LGA-10020A			37 Microhenries
L13	3rd Video IF	.1Ω		TSA-10030B			Not used in chassis 9022.
L14	Fil. Choke	0Ω		LGA-10019A			
L15	RF Choke	4Ω		LGA-10020A			37 Microhenries
L16	4th Video IF	.1Ω		TSA-10030B			
L17	RF Choke	4Ω		LGA-10020A			37 Microhenries
L18	5th Video IF	.1Ω		TSA-10030B			
L19	Peaking	8Ω		LGA-10014			120 Microhenries (yellow dot)
L20	4.5MC Trap	1.7Ω		TSA-10050A			
L21	Peaking	8.5Ω		LGA-10025			150 Microhenries wound on 8.2KΩ resistor
L22	Peaking	14Ω		LGA-10015			300 Microhenries (green dot)
L23	Sound IF	1.7Ω		TSA-10050A			
L24	Ratio Det. Trans.	4Ω	.1Ω	TSB-10051			Tap .6Ω
L25	Horiz. Osc.	62Ω		LGA-10017A			
L26	Width Coil	38Ω		TOA-10023C			
L27	Horiz. Lin.	27Ω		TOA-10024			

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			MECK PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M3	3AG pig-tail	.250A	FA-10001		318.250		
M2	3AG pig-tail	.250A	FA-10001		318.250		
M1	3AG	5A	FA-10002		312005	341005	

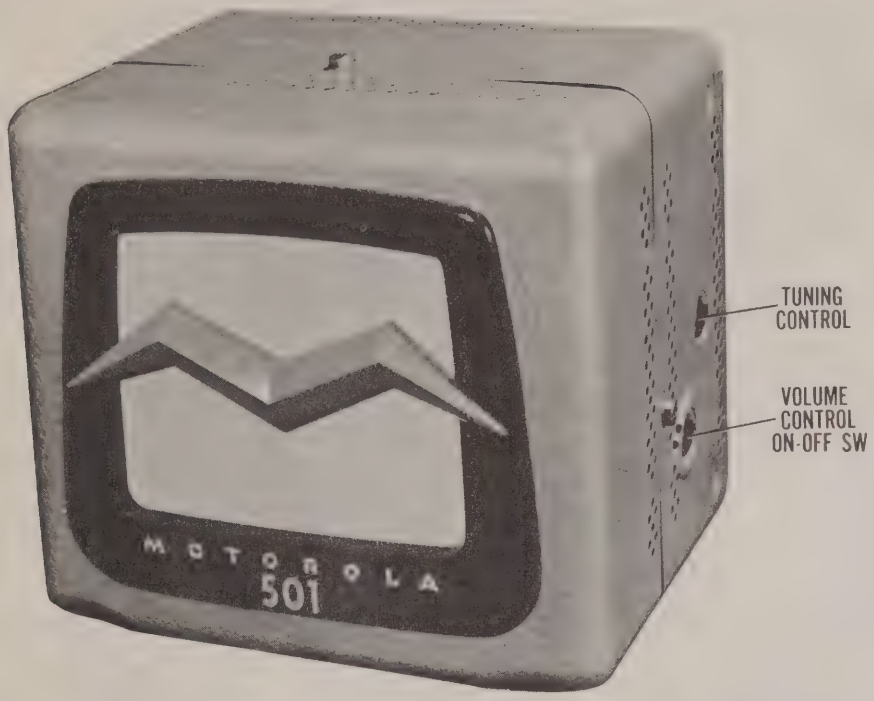
MISCELLANEOUS

ITEM No.	PART NAME	MECK PART No.	NOTES
M4A	RF Tuner	TTA-10007B	
B	RF Tuner	TTC-10004B	Alternate
C	RF Tuner	TTC-10008	Alternate
D	RF Tuner	TTC-10009	Alternate
M5	Crystal	GD-10000	1N60
M6A	Focus Magnet	FCB-10005	
B	Focus Magnet	FCB-10004	Alternate
M7	Ion Trap	ITA-10002	
B2	Trimmer	CTA-10005	25-280MMF (Horiz. Drive)
	Knob	KA-10085	Fine Tuning
	Knob	KA-10086	Contrast
	Knob	KA-10087	Volume-Off/On
	Knob	KA-10091	Channel Selector



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

MOTOROLA
MODEL 501A



MOTOROLA
MODEL 501A

TRADE NAME	Motorola, Model 501A
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated Universal Automotive Superheterodyne Receiver
TUBES (SIX)	Types 6BA6 RF Amp., 6BE6 Converter, 6BA6 IF Amp., 6AT6 Det-AVC-AF, 6AQ5 Power Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 6.6 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1Mfd	High side to pin 7 (grid) of 6BE6, (V2). Low side to chassis.	455KC (400 ∿Mod.)	Tuning cores fully out, (high freq. end).	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	High side thru dummy to ant. receptacle. Low side to chassis.	1610KC	Tuning cores fully out. Check to see that cores project 1 1/8" out of cans.	"	A5, A6, A7	"
3.	"	"	1425KC	Set coil sheild plate 1 1/16" from carriage plate, (see fig. 2).	"	A8, A9, A10	"

After set is installed fully extend antenna and tune in a weak station near 1400KC. Retouch A7 for maximum volume.

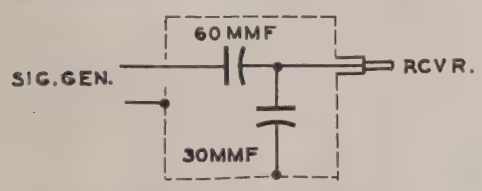


FIG. 1

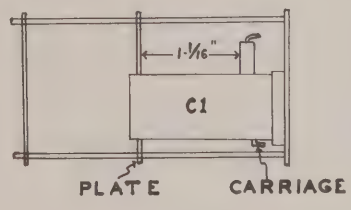


FIG. 2

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1951 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

MOTOROLA MODEL 501A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det.-AVC-AF	6AT6	6AT6	7BT	
V5	Power Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	15	350	23A485677	AFH 3-104		UP15S135C		TVL-3630	■ Filter
B	10	350							▲ Filter
C	20	25							Output Cathode
C2	.006	100	8A4529	P488-006		PTE6D6	GP2-333-602	6TM-D6	RF Coupling
C3	5		21K70720	SI5	TCZ-4.7	5W5V5	GP1K-050	MS-55	RF Coupling
C4	47	500	21R6513	1469-00005	TCZ-47	5R5Q5	NPOL-470	MS-45	Osc. Grid Cap.
C5	.1	400	8R13166	P488-1	DF-104	PTE4P1		4TM-P1	Decoupling
C6	.05	100	8R13514	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C7	27		21R410089	SI27	D6-270	5W5Q3	GP1K-270	5GA-Q25	IF Coupling
C8	.01	100	8R472754	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C9	.01	400	8R9809	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C10	.01	400	8R23690	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Output Plate
C11	.1	100	8R472035	P288-1	DF-104	PTE4P1		2TM-P1	Tone Comp.
C12	.1	100	8R472035	P288-1	DF-104	PTE4P1		2TM-P1	Tone Comp.
C13	.02	1000	8R490449	P1088-02	DF-203	PTE16S2		MB-S2	Buffer Cap.
C14	.5	100	8K17028	P185-5		GT2P5		68P20	Hash Filter
C15	.5	100	8K17028	P185-5		GT2P5		68P20	Hash Filter
C16	90	500	21A591682						Fixed Trimmer

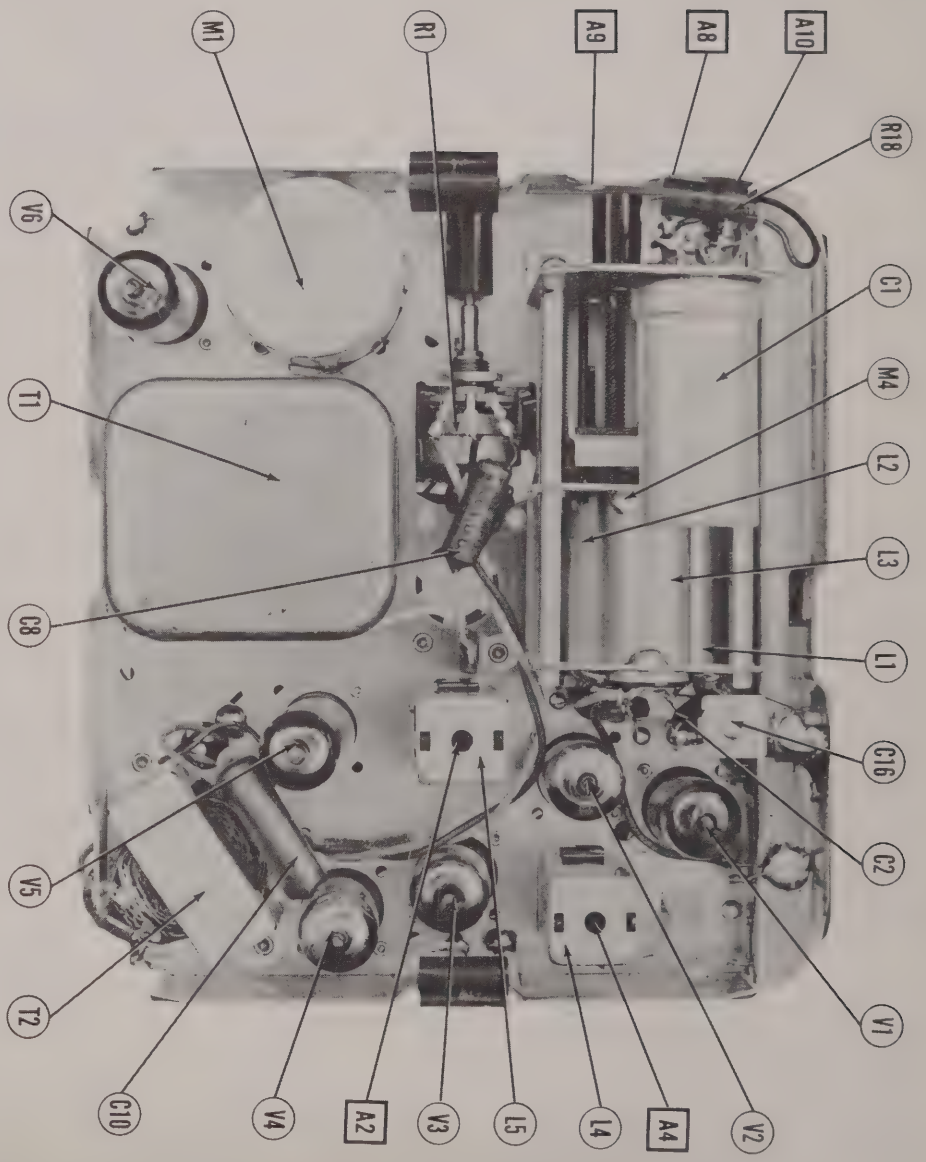
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1	1Meg	½	18A510819				Volume control and switch.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES
R2	470KΩ	½	6R6032	BTS-470K	AVC Network
R3	270Ω	½	6R6432	BTS-270	RF Amp. Cathode
R4	100KΩ	½	6R6075	BTS-100K	AVC Network
R5	47KΩ	½	6R6056	BTS-47K	Osc. Grid
R6	220Ω	½	6R3933	BTS-220Ω	IF Amp. Cathode
R7	6800Ω	2	6R6287	BTB-6800	Decoupling
R8	68KΩ	½	6R6074	BTS-68K	Diode Filter
R9	220KΩ	½	6R6015	BTS-220K	Diode Load
R10	390Ω	½	6R5554	BTS-390	Feedback Network
R11	1Meg	½	6R6004	BTS-1Meg	AVC Network
R12	1Meg	½	6R6004	BTS-1Meg	AVC Network
R13	4700Ω	½	6R6039	BTS-4700	Feedback Network
R14	100KΩ	½	6R6075	BTS-100K	AF Amp. Plate
R15	100KΩ	½	6R6075	BTS-100K	Output Grid
R16	220Ω	1	6R6389	BTA-220	Output Cathode
R17	22Ω	½	6R6406	BW-½-22	Output Cathode
R18	1000Ω	2	6R6184	BTB-1000	Filter
R19	56Ω	½	6R5614		Hash Suppressor
R20	56Ω	½	6R5614		Hash Suppressor

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	6.3VDC ②3.4A	480VCT .050ADC			25B472533	P-4062 ①	P-2972 ①	VT-3 ①

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	5.3KΩ	2.8Ω	405Ω	.62Ω	25B70171	A-3878	A-2930	RO-9 ②	② Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	FIELD RES.	V.C. IMP.	50K500415 or 50B510427	ST803 Mod. 525-V	52A1	
	PM	2.8Ω				
	CONE DIA.	V.C. DIA				
SP2	5 1/8"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MOTOROLA PART No.		
L1	Ant. Coil	12Ω		24B71881		Part of tuner unit.
L2	RF Coil	12Ω		24B71881		Part of tuner unit.
L3	Osc. Coil	.7Ω	2.9Ω	24B592153		Part of tuner unit.
L4	1st IF	19Ω	19Ω	24B485553		
L5	2nd IF	18Ω	18Ω	24B485555		
L5	Hash Choke	0Ω		24A472535		
L7	Hash Choke	0Ω		24K78026		
L8	Hash Choke	0Ω		24K78026		

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA			INSTALLATION NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	RADIART PART No.	
M1	INT	6.3V	115v	48B3333	5342	5342	

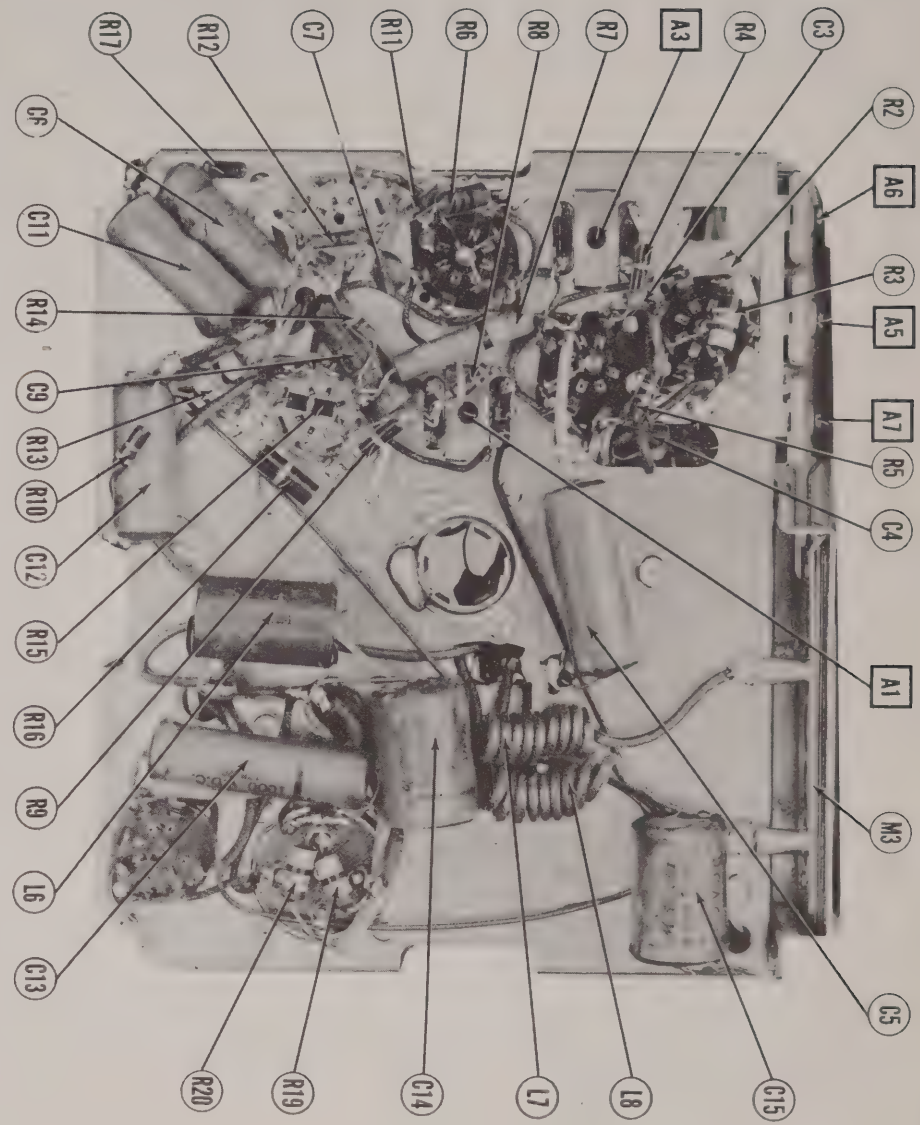
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			MOTOROLA PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M2	SFE	9Amp.	65K16248	9K580705 ③	307009.	155009A	③ Complete with fuse.

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Spark Plate	1X592328	
M4	Tuner Unit	1X510840	
A5	Trimmer Strip	20K592078	Osc. Adj.
A6			RF Adj.
A7			Ant. Adj.

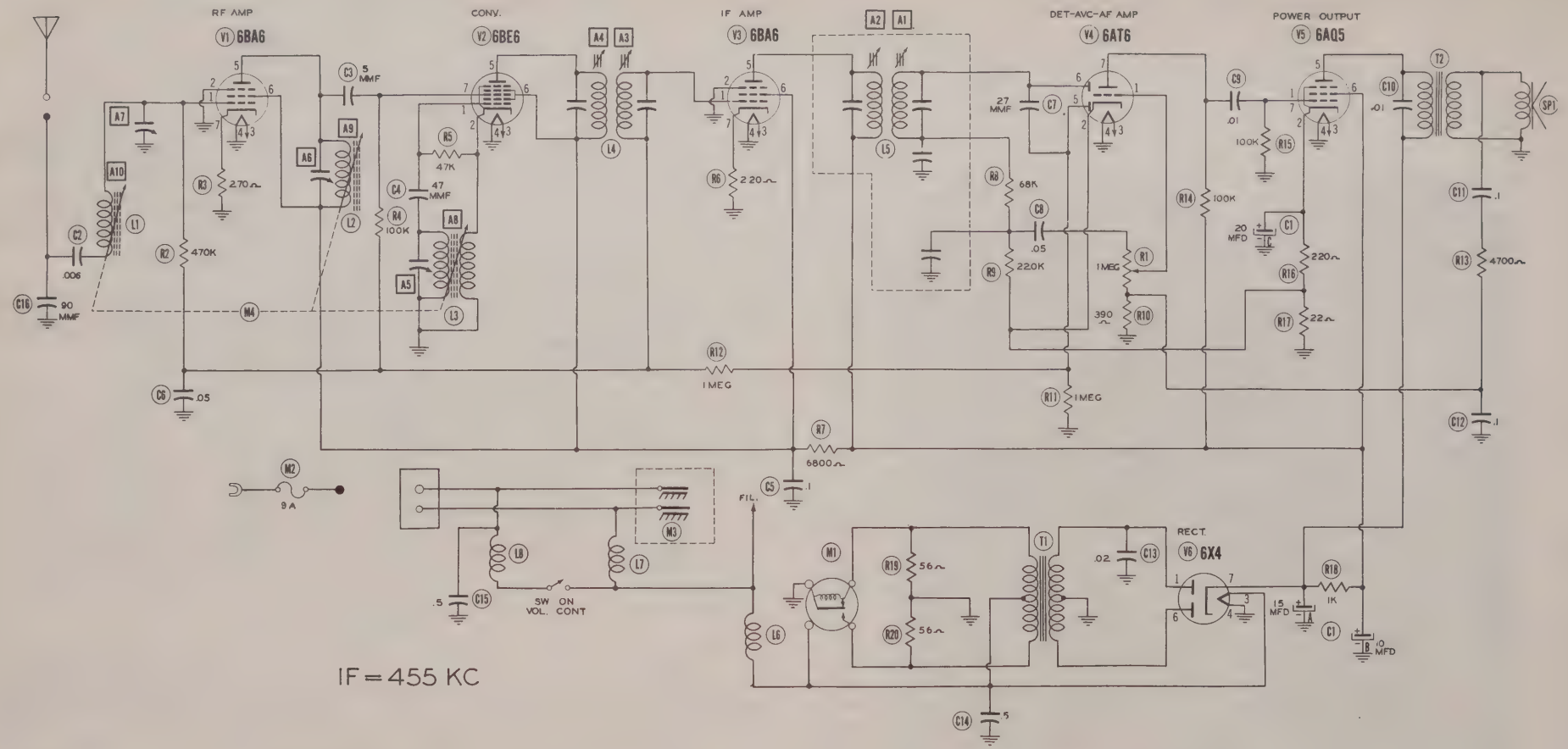
CHASSIS—BOTTOM VIEW



SET 148 FOLDER 12

MOTOROLA MODEL 50IA

MOTOROLA MODEL 50IA



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	-.1Ω	0V	6.3VDC	0V	80VDC	80VDC	1.2VDC
V 2	6BE6	§-5.1VDC	0V	6.3VDC	0V	80VDC	80VDC	-.1Ω
V 3	6BA6	-.2VDC	0V	6.3VDC	0V	195VDC	80VDC	1.5VDC
V 4	6AT6	0V	1.1VDC	6.3VDC	0V	0V	.4VDC	100VDC
V 5	6AQ5	1.8VDC	11.8VDC	0V	6.3VDC	205VDC	195VDC	1.8VDC
V 6	6X4	255VAC	0V	6.3VDC	0V	0V	255VAC	220VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	2.4Meg	0Ω	.4Ω	0Ω	†7.8KΩ	†7.8KΩ	270Ω
V 2	6BE6	47KΩ	.7Ω	.4Ω	0Ω	†7.8KΩ	†7.8KΩ	2.1Meg
V 3	6BA6	2Meg	0Ω	.4Ω	0Ω	†1KΩ	†7.8KΩ	220Ω
V 4	6AT6	390Ω	22Ω	.4Ω	0Ω	1Meg	285KΩ	†100KΩ
V 5	6AQ5	100KΩ	240Ω	0Ω	.4Ω	†300 Ω	†1KΩ	100KΩ
V 6	6X4	350Ω	Inf.	.4Ω	0Ω	Inf.	310Ω	600KΩ

† MEASURED FROM PIN 7 OF V6.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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148-12

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

PHILCO MODELS 51-T1800, 51-T1830, 51-T1832, 51-T1834, 51T-1836, 52-T1810, 52-T1812, 52-T1840, 52-T1842, 52T-1844

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MODEL 51-T1800

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DATE 10-51 SET 148 FOLDER 13

PHOTOFACT* Folder

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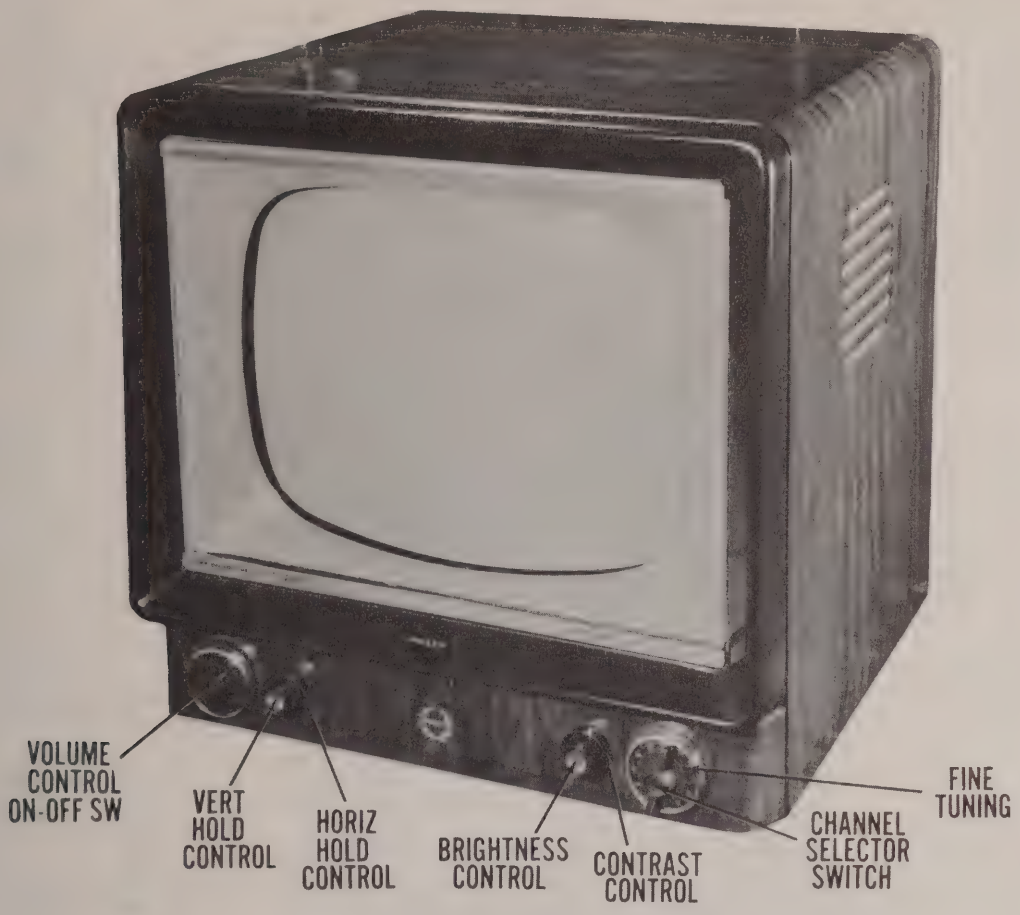

PHILCO MODELS 51-T1800

TRADE NAME	Philco, Models 51-T1800 (Codes 121, 122) 51-T1830, 51-T1832, 51-T1834 (Code 121), 51-T1836 (Codes 123, 125) 52-T1810, 52-T1812, 52-T1840, 52-T1842, 52-T1844 (Codes 122 and 123)
MANUFACTURER	Philco Corp., Tioga and "C" Streets, Philadelphia, Pa.
TYPE SET	Television Receiver
TUBES	Twenty three

POWER SUPPLY 110-120 Volts AC-60Cycle RATING 2.4Amp. at 117 Volts AC
TUNING RANGE—CHANNELS 2 thru 13

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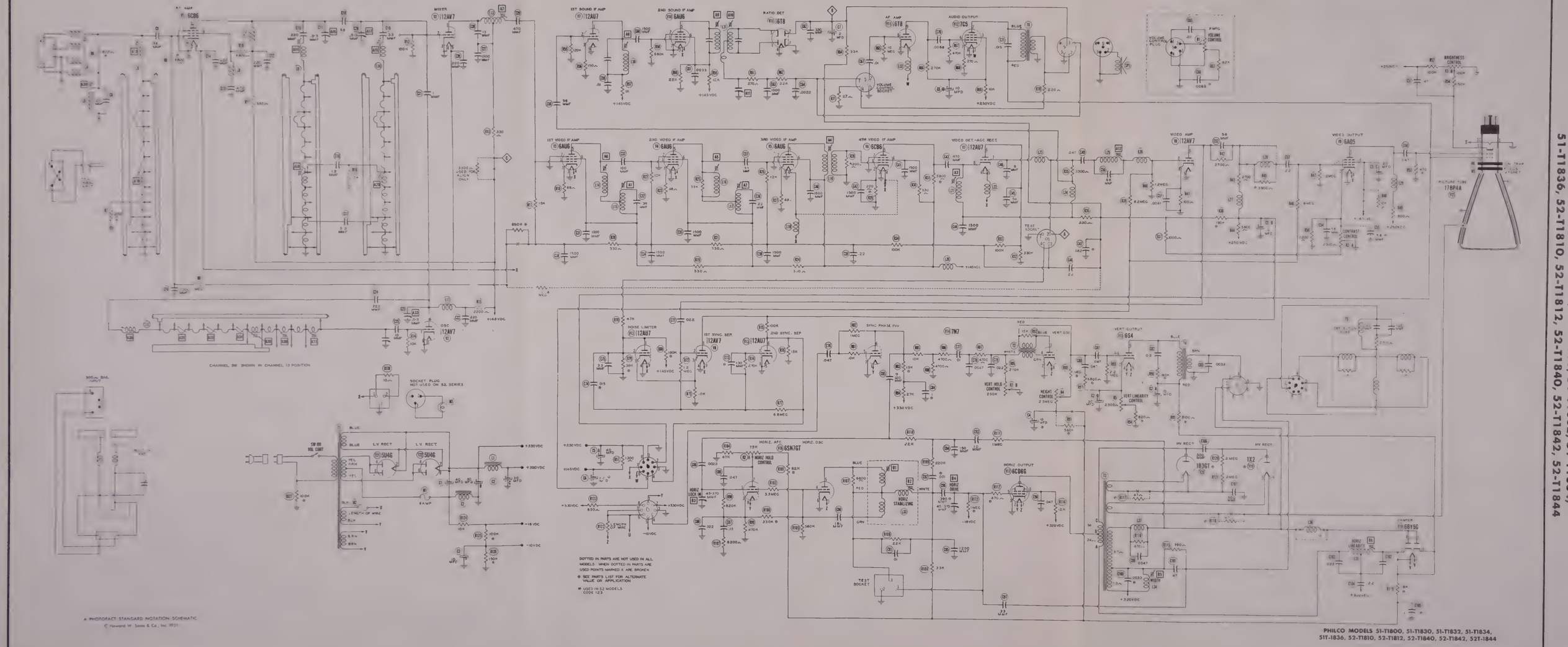
PHILCO MODELS 51-T1800, 51-T1830, 51-T1832, 51-T1834, 51-T1836, 52-T1810, 52-T1812, 52-T1840, 52-T1842, 52-T1844
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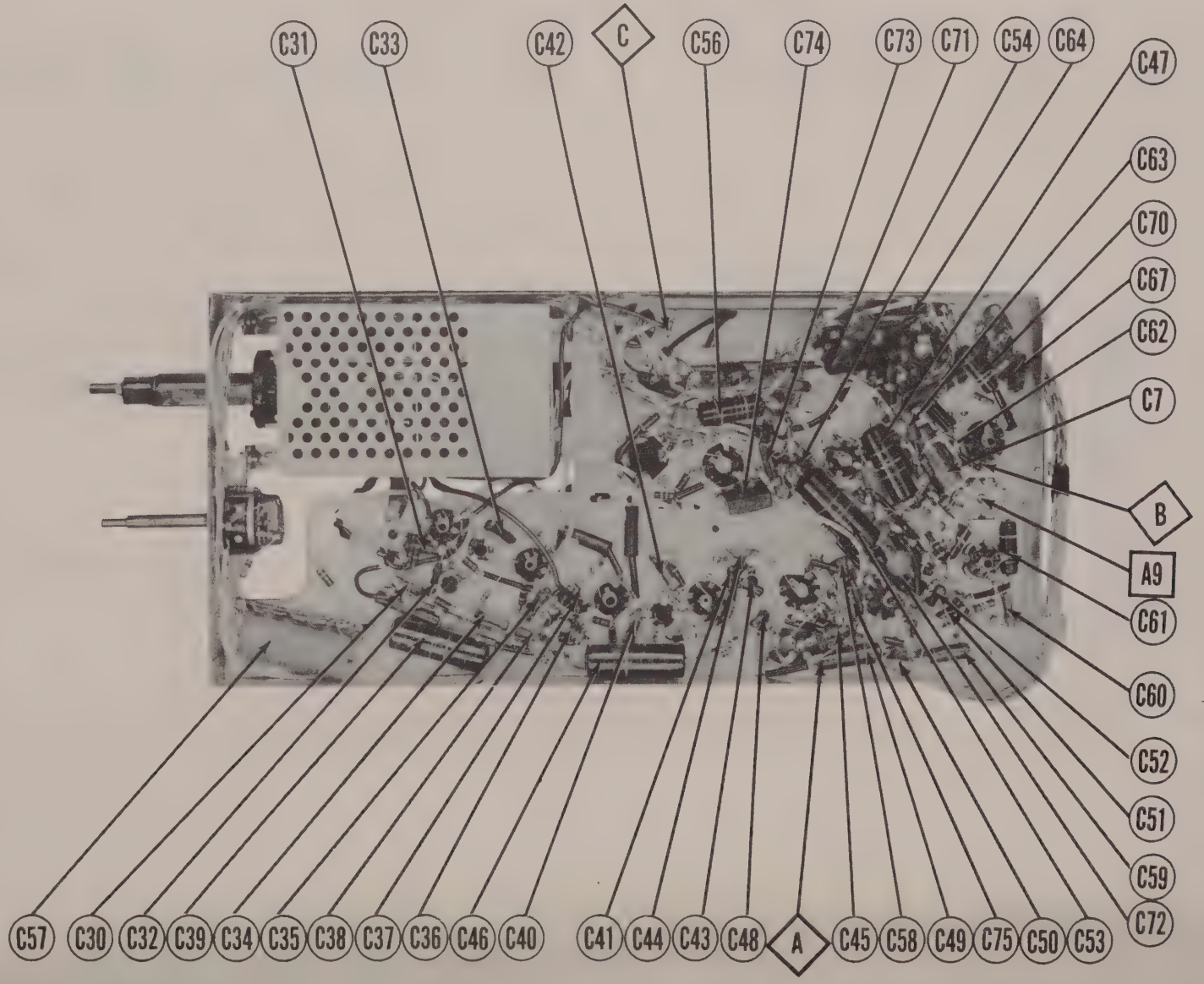
CHANNEL SW SHOWN IN CHANNEL 13 POSITION
SOCKET PLUG NOT USED ON 52 SERIES
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
USED IN 52 MODELS CODE 123
PHILCO MODELS 51-T1800, 51-T1830, 51-T1832, 51-T1834, 51T-1836, 52-T1810, 52-T1812, 52-T1840, 52-T1842, 52T-1844

RF-IF CHASSIS-TOP VIEW



RF-IF CHASSIS-BOTTOM VIEW- CAPACITOR AND ALIGNMENT IDENTIFICATION

PHILCO MODELS 51-T1800, 51-T1830, 51-T1832, 51-T1834, 51-T1836, 52-T1810, 52-T1812, 52-T1840, 52-T1842, 52-T1844

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Turn the channel switch to any channel which causes no interference. Interference may be checked by turning the fine tuning control. If the response curve changes, switch to another channel.
Connect the negative lead of a 3 volt battery to the ungrounded lead of C39, connect the positive lead to chassis.
Pre-set A1 and A2 fully counter-clockwise.
Pre-set A5 and A6 to approximately the center of their range.
Connect the synchronized sweep voltage from the signal generator to the horizontal inputof the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube, (V2) Low side to chassis.	Not used.	29.1MC (400∿ Mod.)	Any (See Note Above)	Vert. Amp. to Point (A). Low side to chassis.	A1	Disconnect bias battery and short AGC line to chassis. Adjust for MINIMUM 400∿ indication on scope.
2.	"	"	"	21.85MC	"	"	A2	"
3.	"	"	"	24.75MC	"	"	A3	Reconnect bias battery. Adjust for maximum 400∿ indication on scope. Attenuate signal generator to maintain 2 volts peak to peak indication.
4.	"	"	"	26.25MC	"	"	A4	"
5.	"	"	"	26.6MC	"	"	A5	"
6.	"	"	"	23.1MC	"	"	A6	"
7.	"	"	"	23.5MC	"	"	A7	"
8.	"	"	24.5MC (10MC SWP)	22.5MC 24.5MC 26.6MC	"	"		Check for response curve within the limits of fig. 1. If more than a slight change of A3 thru A7 is required to bring the response within the limits shown, repeat steps 1 thru 7. A response within the limits of fig. 1 with little or no retouching of A3 thru A7 is more desireable than an ideal response.

SOUND IF ALIGNMENT

Connect a low range output meter across the speaker voice coil.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	2200Ω carbon resistor	High side thru 2200Ω to Point (A). Low side to chassis.	4.5MC (400∿ AM Mod.)	Any	DC Probe to Point (B). Common to chassis.	A8, A9, A10	Adjust for maximum deflection. When adjusting A10, maximum deflection on the VTVM should coincide with MINIMUM on the output meter.
10.	"	"	"	"	"	A10, A11	Adjust for MINIMUM output.

After alignment is finished, restore set to original operation and tune in a local TV station. Turn the fine tuning control for a slightly fuzzy picture. Adjust A10 and A11 for MINIMUM buzz.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	2200Ω carbon resistor	High side thru 2200Ω to Point (A). Low side to chassis.	Not used.	4.5MC (400∿ Mod.)	Any	Vert. Amp. thru detector, (fig. 2). to pin 2 of picture tube. Low side to chassis.	A12	Adjust for MINIMUM 400∿ indication on scope

RF ALIGNMENT

Unsolder the white lead from the tuner and connect it to the negative lead of a 1.5 volt battery. Connect the battery positive lead to chassis.
Unsolder the red lead from the tuner and connect a 3300Ω resistor in series with it. The tuner end of this resistor is alignment Point C , as shown on the schematic.
Connect a 330Ω resistor between the green lead from the tuner and chassis.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

TUNER NO. 76-5747

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point (C). Low side to chassis.	A13, A14 A15	Adjust A13 for maximum curve height and symmetry. Adjust A14 and A15 for symmetrical response centered about 213MC.
13.	"	"	177MC (10MC SWP)	175.25MC 179.75MC	7	"	A16, A17	Carefully observe the response curve with respect to "tilt" and center frequency. Adjust A16 and A17 until the response is a mirror image of the original, that is tilted, in the opposite direction with the center frequency off the same amount in the opposite direction. This is necessary to compensate for the channel 13 adjustments. See figs. 5A and 5B for example of compensation. Repeat steps 12 and 13 until proper response is obtained on both channels 7 and 13.
14.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A18, A19 A20	Adjust A18 for maximum curve height and symmetry. Adjust A19 and A20 for symmetrical response centered about 85MC.

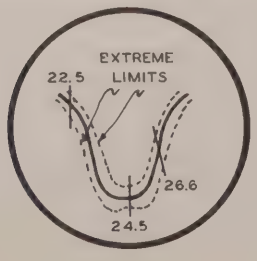


FIG.1

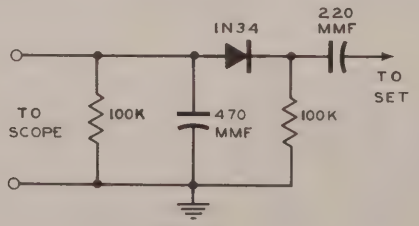


FIG. 2

FIG.3

TUNERS NO. 76-6440-1 and 76-6777-2

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω carbon resistor	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point C. Low side to chassis.	A21, A22, A23	Adjust A21 and A22 for a symmetrical response centered at approximately 213MC. Set marker generator at 213MC, detune A21 counter-clockwise until a single peak appears then adjust A22 until the peak is centered at 213MC. Adjust A23 for maximum amplitude of single peaks. Readjust A21 and A22 for symmetrical response centered at 213MC.
16.	"	"	177MC (10MC SWP)	175.25MC 179.75MC	7	"	A24, A25	Examine the response curve with respect to "tilt" and center frequency. Adjust A32 and A33 until the response is a mirror image of the original, (see remarks column of step 13). Repeat steps 15 and 16 until proper response is obtained on both channels 13 and 7.
17.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A26, A27 A28	Adjust A26 and A27 for a symmetrical response centered at approximately 85MC. Set marker generator to 85MC and detune A26 counter-clockwise until a single peak occurs, then adjust A28 until single peak is centered at 85MC. Readjust A26 and A27 for symmetrical response centered above 85MC.
18.	"	"	69MC (10MC SWP)	67.25MC 71.75MC	4	"	A29	Adjust for maximum amplitude and symmetry of response curve.

OSCILLATOR ALIGNMENT TUNERS NO. 76-5747, 76-6440-1, and 76-6777-2)

Set the fine tuning control so the edge of the cam is centered on the channel 6 oscillator adjustment screw.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
19.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point A. Low side to chassis.	A30	Adjust to place sound marker as shown in fig. 4. The video marker should be at 50%.
20.	"	"	201MC (10MC SWP)	199.25MC 203.75MC	11	"	A31	"
21	"	"	189MC (10MC SWP)	187.25MC 191.75MC	9	"	A32	"
22.	"	'	183MC (10MC SWP)	181.25MC 185.75MC	8	"	A33	Check the oscillator frequency on channel 8. If the frequency is high turn A33 several turns clockwise. If low, turn A33 several turns counter-clockwise. Repeat steps 18 thru 22 until the oscillator frequency is within 500KC of the correct frequency on channels 13, 11, 9, and 8.
23.	"	'	177MC (10MC SWP)	175.25MC 179.75MC	7	"	A34	Adjust to place the sound marker as shown in fig. 4. The video marker should be at 50%.
24.	'	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A35	"
25.	'	"	69MC (10MC SWP)	67.25MC 71.75MC	4	'	A36	"
26.	"	"	57MC (10MC SWP)	55.25MC 59.75MC	2	"	A37	"

FM TRAP ADJUSTMENTS

If interference is encountered from an FM station, adjust A38 to eliminate or minimize the interference.

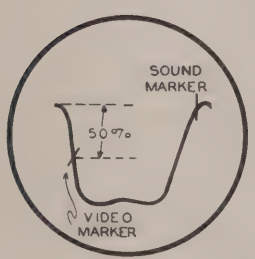


FIG.4

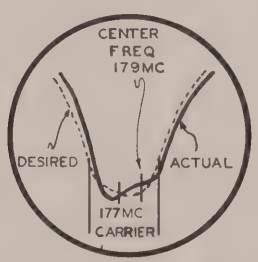


FIG.5A

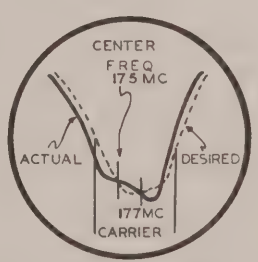


FIG.5B

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	-1.1VDC	0V	0V	6.3VAC	135VDC	120VDC	0V		
V 2	12AV7	155VDC	-4.2VDC	0V	0V	0V	110VDC	§-7.6VDC	0V	6.3VAC
V 3	6AU6	-.2VDC	0V	0V	6.3VAC	125VDC	125VDC	.6VDC		
V 4	6AU6	-.2VDC	0V	0V	6.3VAC	130VDC	130VDC	.6VDC		
V 5	6AU6	-.2VDC	0V	0V	6.3VAC	140VDC	140VDC	.6VDC		
V 6	6CB6	0V	1.9VDC	0V	6.3VAC	110VDC	135VDC	0V		
V 7	12AU7	130VDC	-.1VDC	1.8VDC	6.3VAC	6.3VAC	-.7VDC	.1VDC	1VDC	0V
V 8	12AV7	190VDC	0V	9.5VDC	0V	0V	140VDC	-.2VDC	.9VDC	6.3VAC
V 9	6AQ5	-1VDC	9.6VDC	0V	6.3VAC	240VDC	140VDC	-1VDC		
V 10	6AU6	-.4VDC	0V	0V	6.3VAC	60VDC	60VDC	0V		
V 11	6T8	-.4VDC	-.8VDC	-.4VDC	0V	6.3VAC	-1.5VDC	0V	-.7VDC	70VDC
V 12	7C5	6.3VAC	320VDC	220VDC	0V	250VDC	0V	11.8VDC	0V	
V 13	12AU7	9.8VDC	9.8VDC	9.5VDC	0V	0V	21VDC	-.9VDC	0V	6.3VAC
V 14	7N7	0V	0V	100VDC 210VDC	§-13VDC §-21VDC	§-.9VDC	51VDC	0V	6.3VAC	
V 15	6S4	0V	17VDC 34VDC	0V	0V	6.3VAC	0V	0V	0V	470VDC
V 16	6SN7GT	§-10VDC §-29VDC	90VDC	§-20VDC §10VDC	§-95VDC	340VDC	0V	6.3VAC	0V	
V 17	6CD6G	0V	0V	0V	-27VDC	-27VDC	330VDC	6.3VAC	135VDC	Top Cap *
V 18	6BY5G	550VDC	550VDC	0V	320VDC	320VDC	0V	550VDC	550VDC	
V 19	1X2A	* DO NOT MEASURE								Top Cap *
V 20	1B3GT	* DO NOT MEASURE								Top Cap *
V 21	5U4G	0V	330VDC	0V	300VAC	0V	300VAC	0V	330VDC	
V 22	5U4G	0V	330VDC	-19VDC	300VAC	0V	300VAC	500VDC	330VDC	
V 23	17BP4A	0V	0V	PIN 10 330VDC	PIN 11 0V 140VDC	PIN 12 6.3VAC	H. V. CONNECTOR ** 13K.V.			

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
* DO NOT MEASURE
§ TAKEN WITH VACUUM TUBE VOLTMETER
** USE EXTREME CAUTION WHEN MEASURING THIS VOLTAGE

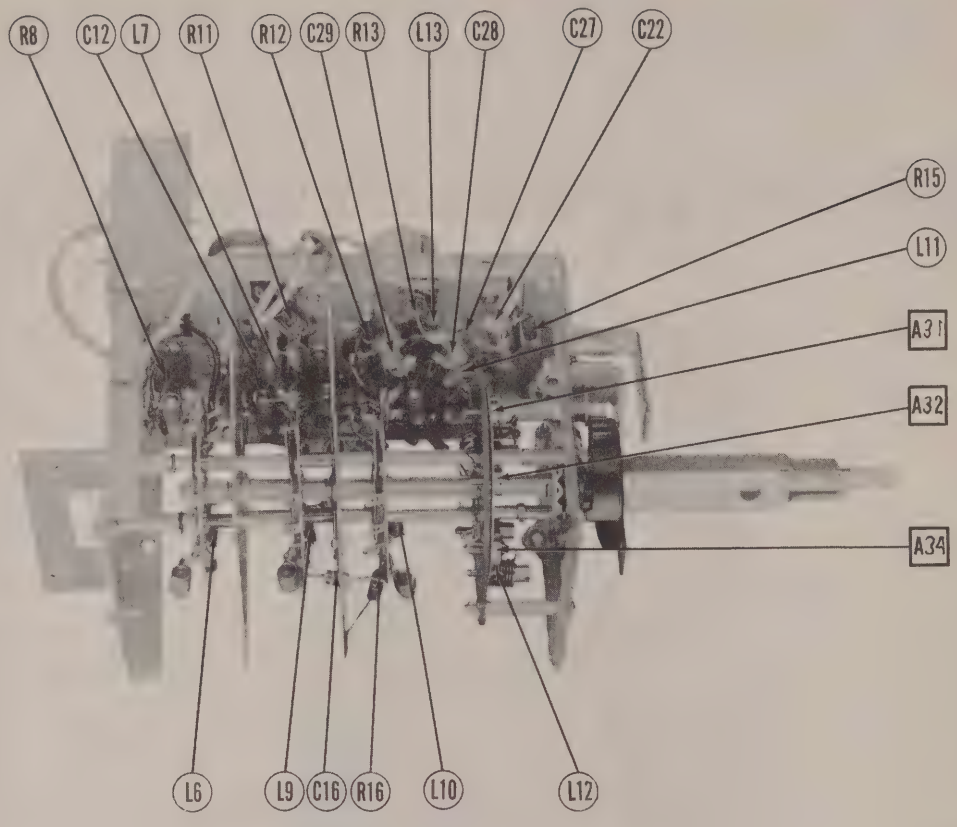
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	1.5Meg	0Ω	0Ω	.1Ω	†2.2KΩ	†9KΩ	0Ω		
V 2	12AV7	†2.2KΩ	100KΩ	0Ω	0Ω	0Ω	†4.1KΩ	10KΩ	0Ω	.1Ω
V 3	6AU6	550KΩ	0Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	68Ω		
V 4	6AU6	545KΩ	0Ω	0Ω	.1Ω	†2.2KΩ	†2.2KΩ	68Ω		
V 5	6AU6	545KΩ	0Ω	0Ω	.2Ω	†1.9KΩ	†1.9KΩ	68Ω		
V 6	6CB6	.2Ω	220Ω	0Ω	.1Ω	†7.5KΩ	†2.2KΩ	0Ω		
V 7	12AU7	†2.9KΩ	120KΩ	150Ω	.1Ω	.1Ω	330KΩ	7.1KΩ 4.6KΩ	3.8KΩ 1.3KΩ	0Ω
V 8	12AV7	†6.2KΩ	8Meg	10KΩ	0Ω	0Ω	†11KΩ	1.2Meg	100Ω	.1Ω
V 9	6AQ5	680KΩ	1.2KΩ 0Ω	0Ω	.1Ω	†2.4KΩ	†1.9KΩ	680KΩ		
V 10	6AU6	680KΩ	0Ω	0Ω	.1Ω	†9KΩ	†9KΩ	0Ω		
V 11	6T8	Inf.	33KΩ	Inf.	0Ω	.2Ω	Inf.	0Ω	10Meg	†280KΩ
V 12	7C5	.1Ω	†480Ω	†10KΩ	27Ω	†600Ω	470KΩ	270Ω	0Ω	
V 13	12AU7	†35KΩ	†35KΩ	10KΩ	0Ω	0Ω	†25KΩ	7Meg	0Ω	.1Ω
V 14	7N7	0Ω	0Ω	#3.5Meg #1Meg	520KΩ 270KΩ	†1Meg	†17KΩ	0Ω	.1Ω	
V 15	6S4	Inf.	3.3KΩ §20Ω	2.2Meg	0Ω	.1Ω	2.2Meg	Inf.	Inf.	#5.1KΩ
V 16	6SN7GT	800KΩ	#80KΩ	290KΩ	320KΩ	#51KΩ	0Ω	.1Ω	0Ω	
V 17	6CD6G	Inf.	0Ω	0Ω	1Meg	1Meg	#51KΩ	.1Ω	†12KΩ	Top Cap #35Ω
V 18	6BY5G	110KΩ	#.1Ω	Inf.	†70Ω	†70Ω	Inf.	110KΩ	110KΩ	
V 19	1X2A	PINS 1-9 HAVE INF. RESISTANCE								Top Cap # Inf.
V 20	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								Top Cap # 93Ω
V 21	5U4G	Inf.	14KΩ	Inf.	68Ω	Inf.	68Ω	Inf.	14KΩ	
V 22	5U4G	Inf.	14KΩ	10KΩ	68Ω	Inf.	68Ω	#5.1KΩ	14KΩ	
V 23	17BP4A	0Ω	470KΩ	PIN 10 †0Ω	PIN 11 †200KΩ †150KΩ	PIN 12 .1Ω				

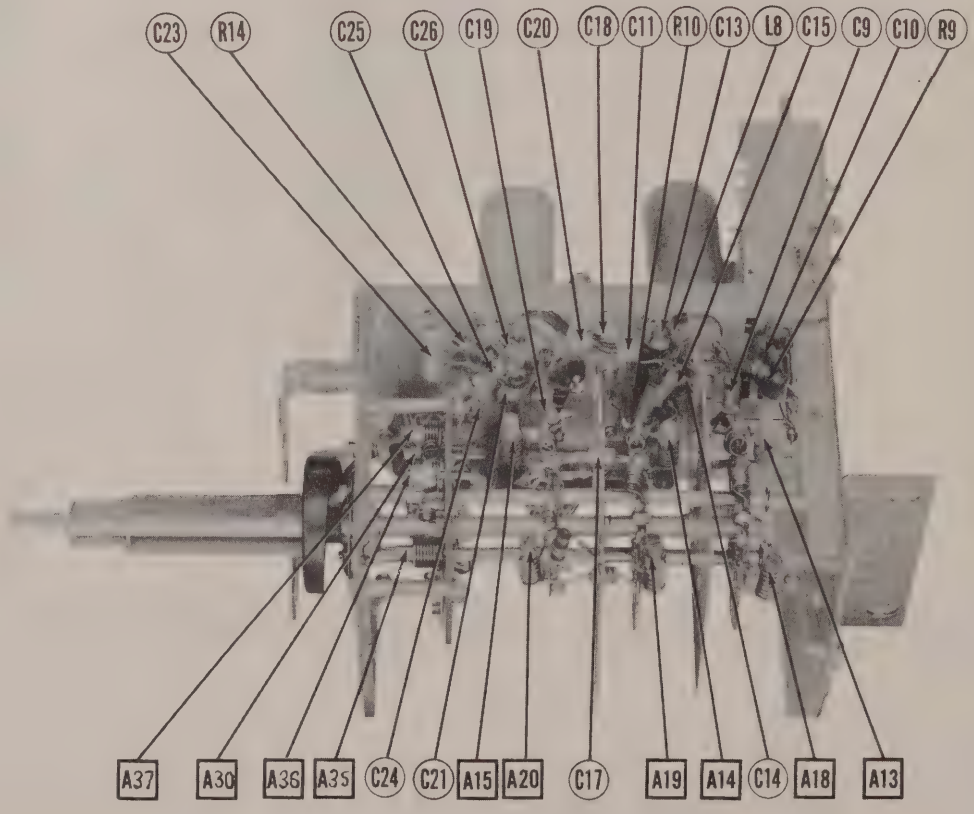
ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
† MEASURED FROM PIN 8 OF V22
# MEASURED FROM PINS 1, 7 AND 8 OF V18.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

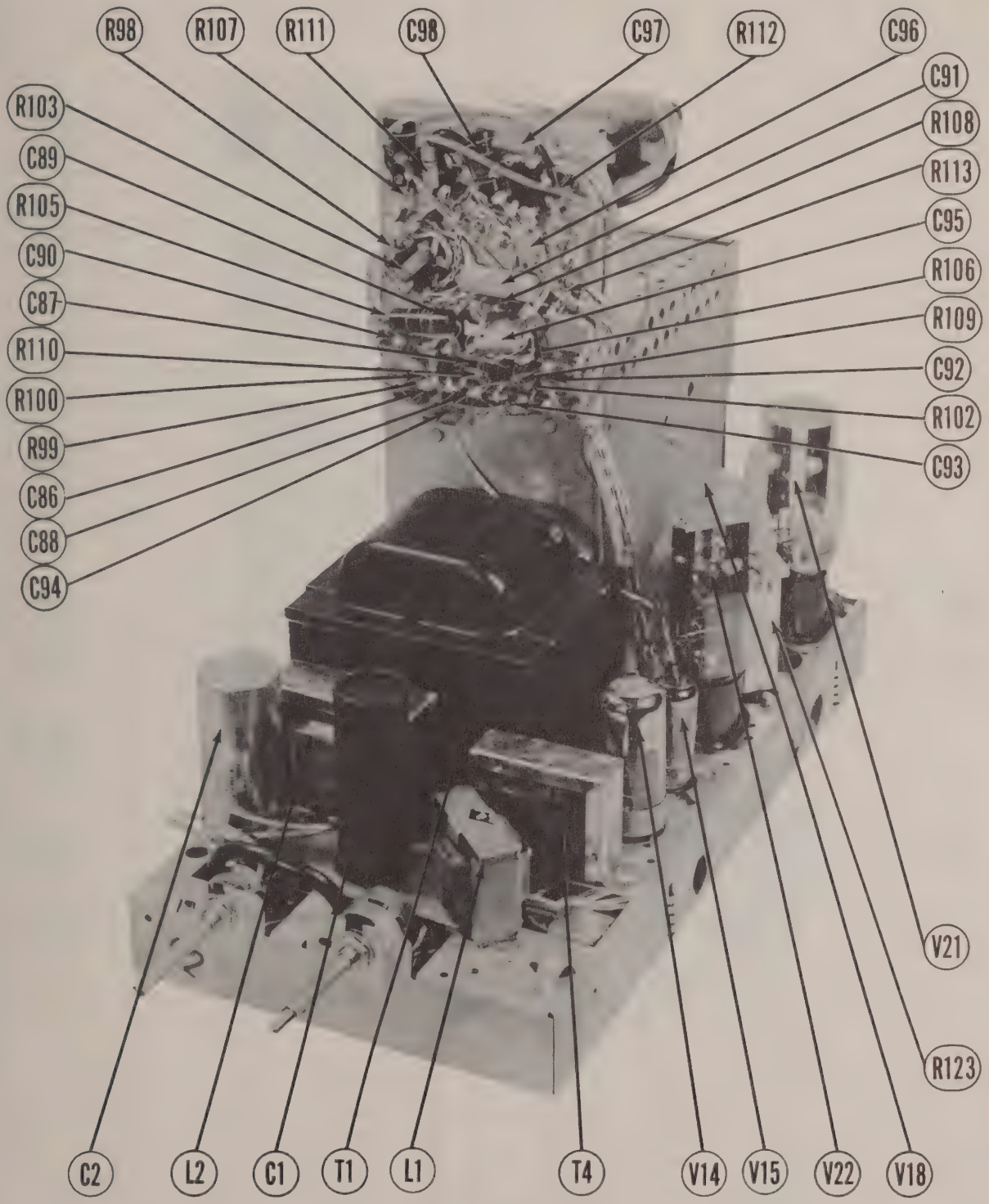
RF-IF CHASSIS-BOTTOM VIEW -RESISTOR AND INDUCTOR IDENTIFICATION



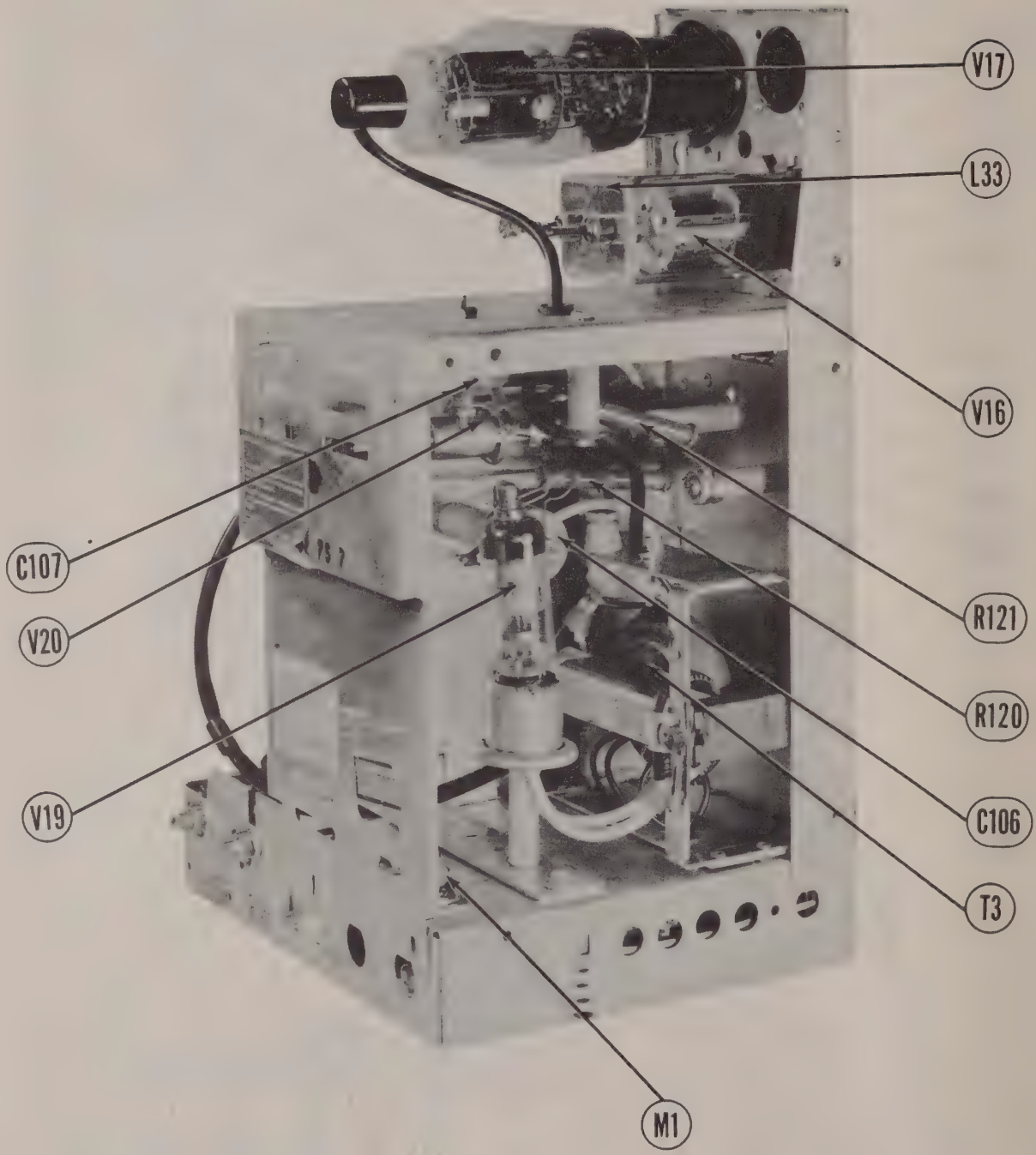
RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE



SWEEP CHASSIS-TOP VIEW



SWEEP CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		PHILCO PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6CB6	6CB6	7CM	
V2	Converter	12AV7	12AV7	9A	
V3	1st. Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd. Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd. Video IF Amp.	6AU6	6AU6	7BK	
V6	4th. Video IF Amp.	6CB6	6CB6	6CM	
V7	Video Detector - AGC Rectifier - 1st. Sound IF Amp.	12AU7	12AU7	9A	
V8	Video Amplifier - 1st. Sync. Sep.	12AV7	12AV7	9A	
V9	Video Output	6AQ5	6AQ5	7BZ	
V10	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Detector - AF Amplifier	6T8	6T8	9E	
V12	Audio Output	7C5	7C5	6AA	
V13	2nd. Sync. Sep.- Noise Limiter	12AU7	12AU7	9A	
V14	Sync. Phase Inv.- Vert. Oscillator - Vert. Discharge	7N7	7N7	8AC	
V15	Vert. Output	6S4	6S4	9AC	
V16	Horiz. AFC-Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V17	Horiz. Output	6CD6G	6CD6G	5BT	
V18	Damper	6BY5G	6BY5G	6CN	
V19A	HV Rectifier	1X2A	1X2A	9Y	
B	HV Rectifier	1X2	1X2	9Y	
V20A	HV Rectifier	1B3GT	1B3GT	3C	
B	HV Rectifier	1X2	1X2	9Y	
V21	LV Rectifier	5U4G	5U4G	5T	
V22	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA			RTMA BASE TYPE	NOTES
	PHILCO PART No.	SYLVANIA PART No.	THOMAS PART No.		
V23	17BP4A	17BP4A	17BP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1	40	450	30-2568-48	AFH1-52		UPT4045		TVL-1725	Filter
C2A	10	475	30-2570-62			UPT36145		TVL-4813	▲ Vert. Output Dec.
B	50	450				BR252A			■ Filter
C	30	450							▲ Filter
D	30	25							Vert. Output Cathode
C3	10	25	30-2417-8	PRS25/10		BR102A		TVA-1204	Bias Filter
C4	10	475	30-2417-19	PRS500/10		BR1050A		TVA-1802	Vert. Osc. Dec. ††
C5A	40	450	30-2570-70			UPT421145		TVL-4840	Decoupling
B	10	450							Decoupling
C	20	450							Video Output Screen
D	10	450							Audio Output Screen
C6	20	450							Decoupling *
C7	2	50	30-2417-7	E26E6		BBR2-50T		TVA-1301	Stabilizing Cap.
C8	20		62-2030911	SI20			GP1K-200		Fixed Trimmer
C9	39		62-039409011	SI39	D6-390		GP1K-390		RF Coupling
C10	10000		30-1238-2	BPD-01	DD-103		821-01	5HK-S1	AGC Filter
C11	.5-3		31-6520-1		829-3				Variable Trimmer
C12	220		30-1225-11	SI220	D6-221		GP2K-221	5GA-T22	RF Amp. Plate
C13	470		62-147001001	SI470	D6-471		GP2K-471	5GA-T47	RF Amp. Screen
C14	220		30-1225-11	SI220	D6-221		GP2K-221	5GA-T22	RF Amp. Fil.
C15	220		30-1225-11	SI220	D6-221		GP2K-221	5GA-T22	RF Coupling
C16	1.2		30-1221-7				NP0K-1R2		RF Coupling
C17	3.3		30-1221-9	SI3.3NP0	TCZ-3.3		NP0K-3R3		RF Coupling
C18	.68		30-1221-11		TCZ-.68		NP0K-R68		RF Coupling
C19	33		62-033009001	SI33	D6-330		GP1K-330	5GA-Q33	Fixed Padder
C20	.5-3		381-6520-1		829-3				Variable Trimmer
C21	1		30-1224-7				N750K-010		Osc. Coupling
C22	220		30-1225-11	SI220	D6-221		GP2K-221	5GA-T22	RF Bypass
C23	.5-3		31-6520-1		829-3				Variable Trimmer
C24	220		30-1225-11	SI220	D6-221		GP2K-221	5GA-T22	Osc. Feedback
C25	10		30-1224-50	SI10N750	TCN-10		N750K-100	5TCU-Q1	Osc. Grid Cap.
C26	220		30-1225-11	SI220	D6-221		GP2K-221	5GA-T22	Conv. Fil.
C27	1500		62-215001011	SI1500	D6-152		GP2L-152	5HK-D15	Mixer Plate Dec.
C28	15		62-015409011	SI15	D6-150		GP1K-150	5GA-Q15	Fixed Trimmer
C29	470		62-147001001	SI470	D6-471		GP2K-471	5GA-T47	IF Coupling
C30	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	AGC Filter
C31	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	1st. Video IF Dec.
C32	39		62-039409011				N220L-390		Fixed Trimmer
C33	100		62-110009001	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	IF Coupling
C34	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	AGC Filter
C35	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	2nd. Video IF Dec.
C36	22		63-022009001		TCZ-22		NP0K-220	5TCC-Q22	Fixed Trimmer
C37	33		62-03300001	SI33	D6-330		GP1K-330	5GA-Q33	IF Coupling
C38	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	AGC Filter
C39	.22	400	45-3505-49	P488-22		GT4P2		4TM-P22	AGC Filter
C40	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	3rd. Video IF Dec.
C41	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	4th. Video IF Screen
C42	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	4th. Video IF Cathode
C43	470		62-147001001	SI470	D6-471	5W5T5	GP2K-471	5GA-T47	IF Coupling
C44	1500		62-215001011	SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	RF Bypass
C45	56		62-056409001	SI56	D6-560		GP1K-560		AGC Rect. Plate
C46	.22	400	45-3505-49	P488-22		GT4P2		4TM-P22	AGC Filter
C47	.082	400		P488-1	DF-104	PTE4P1		4TM-P1	AGC Filter ††

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C48	8		30-1224-13						Video Det. Filter
C49	.047	300	45-3505-62	P288-47	DF-503	PTE4S5		2TM-S47	Video Coupling
C50	68		62-06840911	S168	D6-680	5W5Q7	GP1K-680	5GA-Q68	Fixed Trimmer
C51	.0047	600	45-3505-56	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Video Amp. Cathode
C52	56		62-05640901	S156	D6-560		GP1K-560		Video Coupling
C53	.22	400	45-3505-48	P488-22		GT4P2		4TM-P22	Video Coupling
C54	56		62-05640901	S156	D6-560		GP1K-560		Video Output Cathode‡
C55	56		62-05640901	S156	D6-560		GP1K-560		Video Output Cathode *
C56	.047	400	45-3505-63	P488-047	DF-503	PTE4S5		4TM-S47	Video Coupling
C57	.47	400	45-3500-4	484-5		GT4P5		4TM-P5	Picture Tube Cathode
C58	56		62-05640901	S156	D6-560		GP1 K-560		Sound IF Coupling
C59	.01	400	45-3505-58	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	1st. Sound IF Dec.
C60	1500		62-21500101	S11500	D6-152	1W5D15	GP2L-152	5HK-D15	Sound IF Coupling
C61	.0033	400	45-3505-55	P688-0033	D6-332	PTE6D3	GP2-333-332	6TM-D3	2nd. Sound IF Dec.
C62	330		60-10335407	S1330	D6-331		GP2K-331	5GA-T33	RF Bypass
C63	1500		62-21500101	S11500	D6-152	1W5D15	GP2L-152	5HK-D15	RF Bypass
C64	.0022	400	45-3505-54	P688-0022	D6-222	PTE6D2	GP2-333-222	6TM-D22	De-emphasis
C65	.01	400	45-3505-58	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C66	.0068	400	45-3505-60	P488-0068	D6-682		GP2-333-682	6TM-D68	Tone Comp. ¶
C67	.01	400	45-3505-58	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C68	NOT USED								
C69	NOT USED								
C70	.0068	400	45-3505-60	P488-0068	D6-682		GP2-333-682	6TM-D68	Audio Coupling
C71	.015	1000	45-3505-59	P1088-015		PTE16S15		MB-S15	Audio Output Plate
C72	.022	400	45-3505-60	P488-022	DF-303	PTE4S2		4TM-S22	Sync. Coupling
C73	130	500		1468-00015	D6-151	5W5T15	GP2K-151	1FM-315	Sync. Coupling ††
C74	.015	200	45-3505-59	P288-015		PTE6S15		6TM-S15	Sync. Coupling
C75	33		62-03300001	S133	D6-330		GP1K-330	5GA-Q33	Noise Limiter Plate
C76	.047	400	45-3505-62	P488-047	DF-503	PTE4S5		4TM-S47	Sync. Coupling
C77	.01	400	45-3505-58	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Vert. Sync. Coupling
C78	.0047	600	45-3505-56	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Vert. Integrator Net.
C79	.022	600	45-3505-60	P688-022	DF-203	PTE6S2		6TM-S22	Vert. Integrator Net.
C80	.047	400	45-3505-62	P488-047	DF-503	PTE4S5		4TM-S47	Vert. Discharge
C81	.047	400	45-3505-62	P488-047	DF-503	PTE4S5		4TM-S47	Vert. Sweep Coupling
C82	.015	400	45-3505-59	P488-015		PTE4S15		5TM-S15	Vert. Output Plate
C83	.0033	400	45-3505-55	P688-0033	D6-332	PTE6D3	GP2-333-332	6TM-D3	Fixed Trimmer
C84	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Decoupling *
C85	130	500	62-10125237	1468-00015	D6-121	5W5T15	GP2K-121	1FM-315	Horiz. Sync. Coupling †
C86	.0022	400	45-3505-54	P688-0022	D6-222	PTE6D2	GP2-333-222	6TM-D22	Horiz. Sync. Coupling
C87	.15	200	45-3505-46	P288-15				2TM-P15	AFC Filter
C88	.022	300	45-3505-43	P288-022	DF-203	PTE4S2		4TM-S22	AFC Filter
C89	.047	400	45-3505-62	P488-047	DF-503	PTE4S5		4TM-S47	AFC Plate
C90	180	1000	30-1244-5	1469-HV-0002					Horiz. Osc. Grid Cap.
C91	.01	600	60-30103404	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Fixed Trimmer
C92	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Horiz. Feedback *
C93	10	500	30-1244						Horiz. Feedback
C94	150	500	60-10155407	1468-00015	D6-151	5W5T15	GP2K-151	1FM-315	Voltage Divider
C95	1200	500	60-20125404	1464-001		IR5D15		MS-21	Horiz. Discharge
C96	390	500							Horiz. Sweep Coupling †
C97	33	1000	30-1244-6						Horiz. Feedback
C98	.047	400	45-3505-62	P488-047	DF-503	PTE6S5		4TM-S47	Horiz. Output Screen
C99	.0047	600	45-3505-56	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Fixed Trimmer
C100	.0033	600		P688-0033	D6-332	PTE6D3	GP2-333-332	6TM-D3	Fixed Trimmer *
C101	.47	200	45-3505-34	P288-47		GT2P5		2TM-P47	Horiz. Sweep Coupling
C102	.1	200	45-3505-47	P288-1	DF-104	PTE4P1		2TM-P1	Damper Filter
C103	.033	300	45-3505-61	P488-033		PTE6S3		6TM-S3	Damper Filter
C104	.22	400		P488-22				4TM-P22	Damper Filter
C105	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Damper Filter *
C106	500	20000	30-1229-4	HV20C	TV3-502				HV Doubler
C107	500	20000	30-1229-4	HV20C	TV3-503				HV Filter

* Not used in all models.
† Some models use 220MMF. in this application Part # 60 -10225417.
‡ Some models use 82MMF. in this application.
¶ Some modles use .015MFD. in this application.
†† Some models use .1MFD. in this application.
‡‡ Some models use 180MMF. in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2Meg		33-5564-10	Q18-139X	AT-116	BT-78-S	Volume Control - Tapped at 1Meg
B	Shaft		Not req.	Not req.	FS-3	Not req.	Attach to R1A per Instructions
C	Switch		Not req.	76-1	SW-A	Not req.	Attach to R1A per Instructions
R2A	75KΩ		33-5563-39		RTV-241	SBB-651	Horiz. Hold Control - Front
B	250KΩ						Vert. Hold Control - Rear
R3A	2500Ω	2	33-5563-27		RTV-242		Contrast Control - Wire Wound - Front
B	100KΩ						Brightness Control - Rear
R4A	2.5Meg		33-5565-27	Q11-239	AG-84-S	AN-83	Height Control
B	Shaft		Not req.	RQ	FKS-1/4	AK-1	Attach to R4A per Instructions
R5	2500	2	33-5546-40	W-3000 #	43-2500 #	VK-132	Vert. Linearity Control - Wire Wound

Fashion Shaft to duplicate original.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R6	1800Ω		66-2188340	BTS-1800	Antenna Load-See Note 1
R7	1200Ω		66-2128340	BTS-1200	Antenna Coil Shunt - See Note 1
R8	1Meg	20%	66-5108340	BTS-1Meg	AGC Network
R9	6800Ω	20%	66-2688340		RF Amp. Grid - See Note 2
R10	6800Ω		66-2688340		RF Amp. Screen
R11	330Ω	20%	66-1338340	BTS-330	RF Amp. Decoupling
R12	100KΩ	20%	66-4108340		Mixer Grid
R13	330Ω	20%	66-1338340	BTS-330	Mixer Decoupling
R14	10KΩ		66-3108340		Osc. Grid
R15	2200Ω	20%	66-2228340	BTS-2200	Osc. Plate
R16	10KΩ		66-3108340		Mixer Grid Coil Shunt
R17	15KΩ		66-3158340		1st. Video IF Amp. Grid
R18	68Ω		66-0688340		1st. Video IF Amp. Cathode
R19	330Ω		66-1338340	BTS-330	1st. Video IF Amp. Decoupling
R20	330Ω		66-1338340	BTS-330	AGC Network
R21	330Ω		66-1338340	BTS-330	AGC Network

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
R22	12KΩ		66-3128340	BTS-12K	2nd. Video IF Amp. Grid
R23	68Ω		66-0688340		2nd. Video IF Amp. Cathode
R24	330Ω		66-1338340	BTS-330	Decoupling
R25	33KΩ		66-3338340		3rd. Video IF Transformer Shunt
R26	12KΩ		66-3128340		3rd. Video IF Amp. Grid
R27	68Ω		66-0688340		3rd. Video IF Amp. Cathode
R28	8200Ω		66-2828340	BTS-8200	4th. Video IF Transformer Shunt
R29	220Ω			BTS-220	4th. Video IF Amp. Cathode - See Note 3
R30	330Ω		66-1338340	BTS-330	4th. Video IF Amp. Screen
R31	5600Ω				4th. Video IF Amp. Plate - See Note 4
R32	330KΩ		66-4338340	BTS-330K	AGC Load
R33	100KΩ		66-4108340	BTS-100K	AGC Network
R34	100KΩ		66-4108340	BTS-100K	AGC Network
R35	3300Ω		66-2338340	BTS-3300	Video Detector Diode Load
R36	330Ω		66-1338340	BTS-330	Isolation
R37	1000Ω		66-2108340	BTS-1000	Voltage Divider
R38	180KΩ			BTS-180K	Voltage Divider - See Note 5
R39	8.2Meg		66-5828340	BTS-8.2Meg	Bias Network
R40	1.2Meg		66-5128340	BTS-1.2Meg	Video Amp. Grid
R41	100Ω		66-1108340	BTS-100	Video Amp. Cathode
R42	2700Ω		66-2278340	BTS-2700	Video Amp. Plate
R43	2700Ω		66-2278340	BTS-2700	Video Amp. Plate
R44	5600Ω		66-2568340	BTA-5600	Decoupling
R45	3900Ω			BTS-3900	Video Peaking Coil Shunt - See Note 6
R46	1.8Meg		66-5188340	BTS-1.8Meg	Bias Network
R47	1.2Meg	20%	66-5128340	BTS-1.2Meg	Video Output Grid
R48	10KΩ		66-3108340	BTS-10K	Video Output Screen - See Note 1
R49	1800Ω	5	33-1335-102	1 3/4A-1750	Video Output Plate - Wire Wound
R50	2200Ω	20%	66-2228340	BTS-2200	Contrast Control Shunt
R51	1300Ω	10	33-3435-310	1 3/4A-1250	Decoupling - Wire Wound
R52	100KΩ		66-4108340	BTS-100K	Voltage Divider
R53	470KΩ		66-4478340	BTS-470K	Picture Tube Grid
R54	150KΩ		66-4158340	BTS-150K	Picture Tube Cathode
R55	120KΩ		66-4128340	BTS-120K	1st. Sound IF Amp. Grid
R56	150Ω		66-1158340	BTS-150	1st. Sound IF Amp. Cathode
R57	1000Ω		66-2108340	BTS-1000	1st. Sound IF Amp. Decoupling
R58	680KΩ	20%	66-4688340		2nd. Sound IF Amp. Grid
R59	12KΩ		66-3124340		2nd. Sound IF Amp. Decoupling
R60	22KΩ		66-3224340	BTA-22K	Voltage Divider
R61	270Ω		66-1278340	BTS-270	Balancing
R62	22KΩ		66-3228340	BTS-22K	De-emphasis
R63	82KΩ	20%	66-3828340	BTS-82K	Tone Compensation
R64	33KΩ		66-3338340	BTS-33K	Ratio Detector Diode Load
R65	10Meg	20%	66-6108340	BTS-10Meg	AF Amp. Grid
R66	270KΩ		66-4278340	BTS-270K	AF Amp. Plate
R67	470KΩ		66-4478340	BTS-470K	Output Grid
R68	270Ω	2	66-1274340	BW-2-270	Output Cathode - Wire Wound
R69	10KΩ		66-3108340	BTS-10K	Decoupling
R70	220Ω		66-1228340	BTS-220	Feedback Network
R71	27Ω	2	66-0273340	BW-2-27	Feedback Network - Wire Wound
R72	1.2Meg		66-5128340	BTS-1.2Meg	1st. Sync. Separator Grid
R73	10KΩ		66-3108340	BTS-10K	1st. Sync. Separator Cathode
R74	270KΩ		66-4278340	BTS-270K	2nd. Sync. Separator Grid
R75	100KΩ		66-4108340	BTS-100K	2nd. Sync. Separator Plate
R76	15KΩ		66-3158340	BTS-15K	Voltage Divider
R77	6.8Meg		66-5688340	BTS-6.8Meg	Voltage Divider
R78	47KΩ		66-3478340	BTS-47K	Series Test Jack
R79	39KΩ	5%		BTS-39K-5%	Noise Gate Grid - See Note 7
R80	180KΩ			BTS-180K	Voltage Divider - See Note 8
R81	10KΩ		66-3108340	BTS-10K	Sync. Phase Inverter Grid
R82	1Meg		66-5108340	BTS-1Meg	Sync. Phase Inverter Grid
R83	15KΩ	2		BTB-15K	Sync. Phase Inverter Plate - See Note 9
R84	27KΩ	2		BTB-27K	Sync. Phase Inverter Plate Decoupling
R85	10KΩ		66-3108340	BTS-10K	Integrator
R86	4700Ω		66-2478340	BTS-4700	Integrator
R87	4700Ω		66-2478340	BTS-4700	Integrator
R88	4700Ω		66-2478340	BTS-4700	Voltage Divider
R89	270KΩ		66-4278340	BTS-270K	Vert. Osc. Grid
R90	1Meg		66-5108340	BTS-1Meg	Vert. Osc. Plate - See Note 10
R91	560KΩ		66-4568340	BTS-560K	Vert. Osc. Decoupling - See Note 1
R92	15KΩ		66-3158340	BTS-15K	Vert. Osc. Transformer Shunt
R93	2.2Meg	20%	66-5228340	BTS-2.2Meg	Vert Output Grid
R94	820Ω	1		BTA-820	Vert. Output Cathode - See Note 11
R95	5100Ω	10		1 3/4A-5000	Vert. Output Decoupling - See Note 12 Wire Wound
R96	180KΩ			BTA-180K	Damping - See Note 13
R97	6800Ω		66-268340	BTS-6800	Vert. Peaking - See Note 14
R98	820KΩ		66-4828340	BTS-820K	Horiz. AFC Grid
R99	470KΩ		66-4478340	BTS-470K	Horiz. AFC Cathode
R100	330KΩ	1		BTA-330K	Horiz. AFC Anode - See Note 15
R101	82KΩ	1		BTA-82K	Horiz. AFC Plate - See Note 16
R102	8200Ω		66-2828340	BTS-8200	Horiz. AFC Filter
R103	3.3Meg	5%	66-5334240	BTA-3.3Meg 5%	Voltage Divider
R104	47KΩ		66-3478340	BTS-47K	Voltage Divider
R105	560KΩ	5%	66-4564240	BTA-560K-5%	Horiz. Osc. Grid
R106	33KΩ	5%	66-3334240	BTA-33K-5%	Horiz. Osc. Plate
R107	6800Ω		66-2688340	BTS-6800	Horiz. Osc. Coil Shunt
R108	22KΩ		66-3228340	BTS-22K	Horiz. Osc. Coil Shunt
R109	220KΩ		66-4228340	BTS-220K	Horiz. Feedback Network
R110	22KΩ		66-3228340	BTS-22K	Horiz. Feedback Network
R111	1Meg	20%	66-5104340	BTA-1Meg	Horiz. Feedback Network
R112	470Ω				Parasitic Suppressor - See Note 17
R113	1Meg		66-5108340	BTS-1Meg	Horiz. Output Grid - See Note 18
R114	12KΩ	5	33-1335-103	1 3/4A-12000	Horiz. Output Screen - Wire Wound
R115	390Ω	2	66-1398340	BTS-390	Centering
R116	470Ω	2	66-1475340	BTB-470	Anti Ringing Coil Shunt
R117	4.7Ω		66-9474340		High Voltage Rectifier Filament - See Note 1
R118	4.7Ω		66-9474340		High Voltage Rectifier Filament - See Note 1
R119	18KΩ	1		BTA-18K	Decoupling - See Note 19
R120	2Meg	2	33-1346		HV Rectifier Load
R121	2Meg	2	33-1346		HV Rectifier Load
R122	Length of wire		41-4025		Filament Drop
R123	650Ω	10	33-3445-2	1 3/4A-700	Filter - Wire Wound
R124	10KΩ		66-3108340	BTS-10K	Bias Filter
R125	100KΩ			BTS-100K	Bias Network - See Note 1
R126	150KΩ		66-4158340	BTS-150K	Bias Network - See Note 20
R127	100KΩ	20%	66-4104340	BTA-100K	Isolation - See Note 1

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
R128	10Ω	1	66-0104340		Series Pilot Light

Note 1 Not used in all models.
Note 2 Some models use 4700Ω in this application.
Note 3 Some models use 150Ω in this application.
Note 4 Some models use 680Ω in this application.
Note 5 Some models use 150KΩ in this application.
Note 6 Some models use 10KΩ in this application.
Note 7 Some models use 56KΩ in this application.
Note 8 Some models use 240KΩ in this application.
Note 9 Some models use 33KΩ in this application.
Note 10 Some models use 680KΩ in this application.
Note 11 Some models use 470Ω in this application.
Note 12 Some models use 4200Ω in this application.
Note 13 Some models use 100KΩ in this application.
Note 14 Some models use 3300Ω in this application.
Note 15 Some models use 270KΩ in this application.
Note 16 Some models use 47KΩ in this application.
Note 17 Some models use 100Ω in this application.
Note 18 Some models use 470KΩ in this application.
Note 19 Some models use 4200Ω5W in this application.
Note 20 Some models use 18KΩ in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 2.4A	600VCT @ .325ADC	5VAC @ 6A	6.3VAC @ 1.2A SEC. 4 6.3VAC @ 9A	32-8469		P-3066	

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	170Ω	330Ω	32-8431				Vert. Block Osc. and Trans.
T3	82Ω Tap 24Ω	5Ω Tap 1.3Ω SEC. 2 0Ω SEC. 3 0Ω	32-8509		HVO-5		Horiz. Output Trans.
T4	760Ω	14Ω	32-8454-1	A-8112			Vert. Output Trans.
T5A	12Ω		32-9644	DY-7	MDF-70		Horiz. Deflection Coils
B	47Ω						Vert. Deflection Coils

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T6	5.9KΩ	3.3Ω	480Ω	.7Ω	32-8242-7	A-3823	A-3019	RO-9	Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA PHILCO PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	PM	3.3Ω	38-1641-1	ST108 Mod P6-X	6A15	
	CONE DIA.	V. C. DIA.				
HP2	6"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	150A	64Ω	1.5 Henries	32-8479		C-2974		
L2	320A	49Ω	2.5 Henries	32-8478				

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	PHILCO PART No.		
L3	Ant. Trans.	.7Ω	.4Ω	76-5767		Part of L4
L4	Ant. Trans.	.7Ω	.4Ω			Part of L3
L5	FM Trap	0Ω		32-4438-1		
L6	Ant. Coils	0Ω		76-5774		Includes Wafer and Coils
L7	Plate Choke			32-4112-22		
L8	RF Choke	0Ω				Part of C13
L9	RF Coils	.4Ω		76-5770		Includes Wafer and Coils
L10	Mixer Grid Coils	0Ω		76-5772		Includes Wafer and Coils
L11	RF Choke	.1Ω		32-4112-2		
L12	Osc. Coils	0Ω		76-5768		Includes Wafer and Coils
L13	1st Video IF	.5Ω	Tap.3Ω	32-4359-10		
L14	2nd Video IF	.2Ω		32-4486		
L15	Adj. Sound Trap	0Ω		32-4303-3		
L16	3rd Video IF	.2Ω		32-4486		
L17	Adj. Video Trap	0Ω		32-4496		
L18	Fil. Choke	.1Ω		32-4112-15		
L19	4th Video IF	.2Ω	.2Ω	32-4486-6		
L20	RF Choke	.1Ω		32-4112-15		
L21	5th Video IF	.2Ω		32-4486		
L22	Fil. Choke	.1Ω		32-4112-15		
L23	Peaking	1.9Ω		32-4143-16		40 Microhenries
L24	Peaking	3.5Ω		32-4480-2		100 Microhenries
L25	4.5MC Trap	1.8Ω		32-4463-5		
L26	Peaking	.3Ω				
L27	Peaking	4.4Ω		32-4480-9		180 Microhenries
L28	Peaking	3.7Ω		32-4480-8		125 Microhenries
L29	Peaking	3.5Ω		32-4480-3		100 Microhenries
L30	Sound IF	4.9Ω		32-4449A		
L31	Ratio Det. Trans.	5Ω	.8Ω	32-4450-2		Tap 1.2Ω
L32	Fil. Choke	.1Ω		32-4112-15		
L33	Horiz. Osc. Trans.	55Ω	43Ω	32-4506		Tap 13Ω
L34	Width Coil	2.6Ω		32-4468-4		
L35	Horiz. Lin.	1Ω	Tap3.9Ω	32-4501		
L36	Suppressor Coil	1.9Ω				Not used in all models.
L37	Anti-Ringing Coil	4Ω		32-4480		150 Microhenries

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			PHILCO PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1 M2	3AG Slo Blo Copper Wire②	6/10A	45-2656-18	76-4519-2	313.600	357001	② 2½" Length of #26 Copper Wire

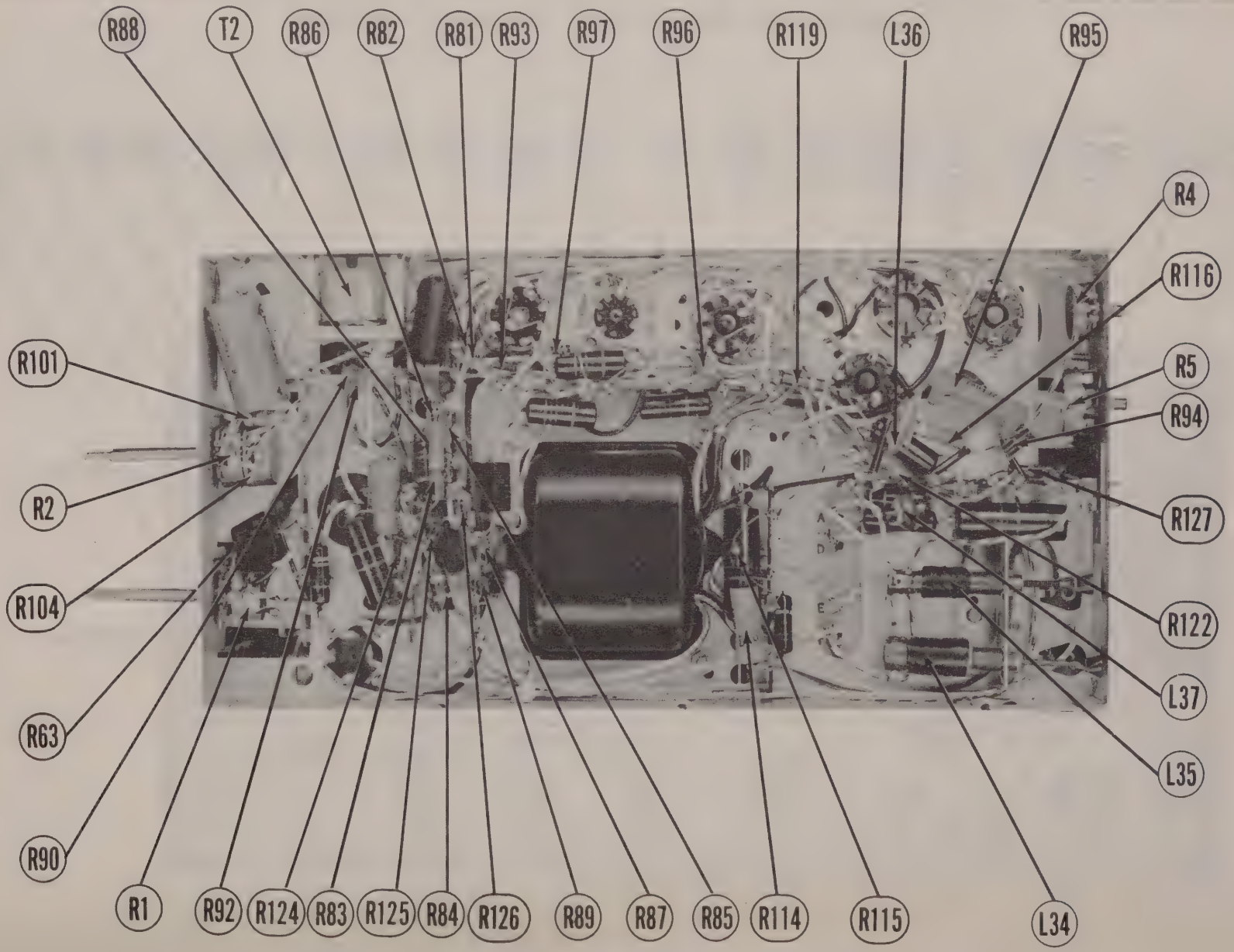
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					PHILCO PART No.		
M3	Bayonet	6-8	.15	Brown	34-2068		Type # 47

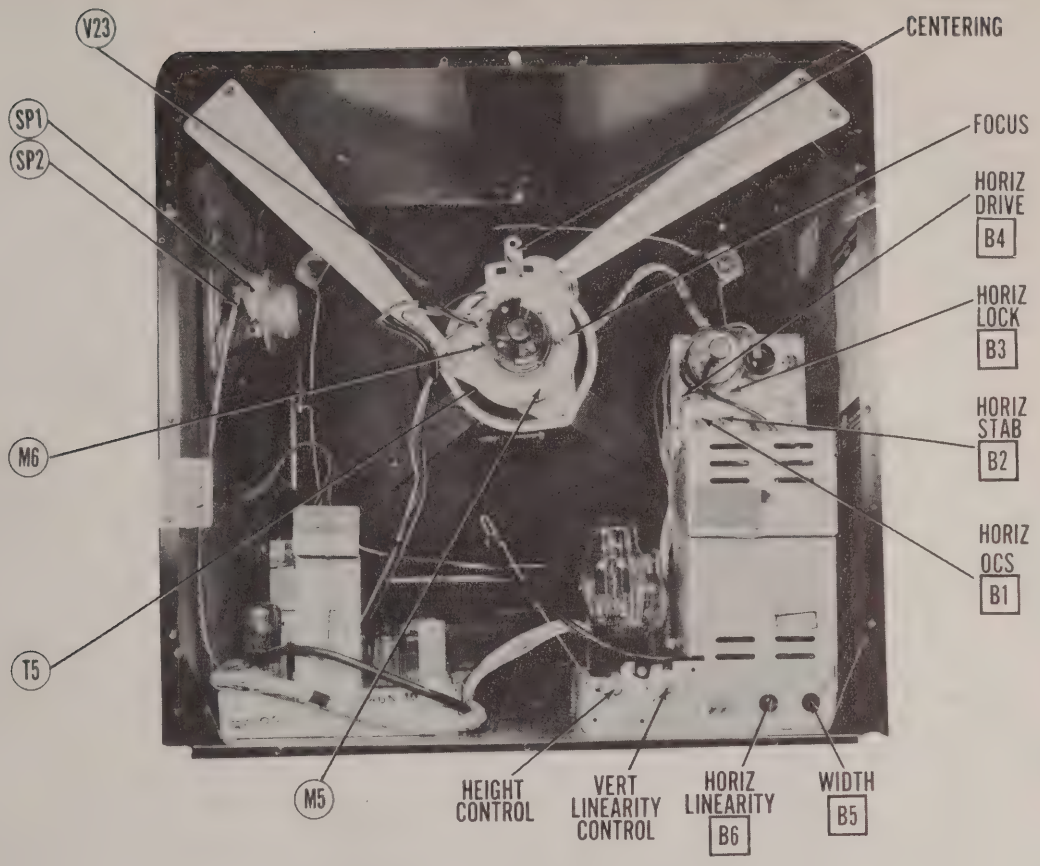
MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M4A	RF Tuner	76-5747	
B	RF Tuner	76-5411	Used in Model 51-T1800 (Code 122) only.
M5	Focus Magnet	76-5725	
M6	Ion Trap	76-6077	
B3	Trimmer	31-6473-22	45-370MMF. (Horiz. Drive)
B4	Trimmer	31-6473-22	45-370MMF. (Horiz. Lock)
C	RF Tuner	76-6777-2	Used in Models 52-T1810, 52-T1812, 52-T1840, 52-T1842, 52-T1844 (all Code 123)

SWEEP CHASSIS-CAPACITOR IDENTIFICATION



SWEEP CHASSIS-RESISTOR IDENTIFICATION



CABINET–REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Pre-set the adjustments as follows:

Horizontal lock-in trimmer, (B3), one turn counter-clockwise from tight.

Stabilizing core, (B2), extending 5/8 in. above the coil mount.

Horizontal drive trimmer, (B4), one turn counter-clockwise from tight.

Horizontal hold control to the center of its range.

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal frequency slug, (B1), until the picture synchronizes horizontally.

Connect the vertical input lead of an oscilloscope to terminal 3 of horizontal test socket.

Adjust the stabilizing core, (B2), until the broad and narrow peaks of the waveform on the scope are of equal height as shown in figure 6.

If necessary adjust B1, to keep the picture synchronized horizontally, during adjustment of B2.

Remove the scope connection and turn the hold control to fully clockwise.

Adjust B1 until there are 4 blanking bars sloping downward to the right.

Turn the hold control fully counter-clockwise. The picture should be out of synchronization. If not, momentarily interrupt the signal by switching to another channel and back again.

Slowly turn the hold control clockwise and carefully note the least number of sloping bars present just before the picture synchronizes. If there are more than $3\frac{1}{4}$ bars present turn B3 slightly clockwise. If there are less than $2\frac{1}{2}$ bars turn B3 slightly counter-clockwise.

Repeat the check and adjustment of B3 until $2\frac{1}{2}$ to $3\frac{1}{2}$ bars are present at the pull-in point.

Adjust the horizontal drive trimmer, (B4), counter-clockwise as far as possible without crowding or vertical lines appearing in the picture.

Adjust the width slug, (B5), until the picture fills the mask horizontally.

Adjust the horizontal linearity slug, (B6), until the picture is symmetrical from left to right. Slight readjustment of B4 may be required to obtain optimum results.

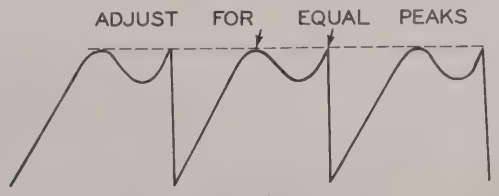
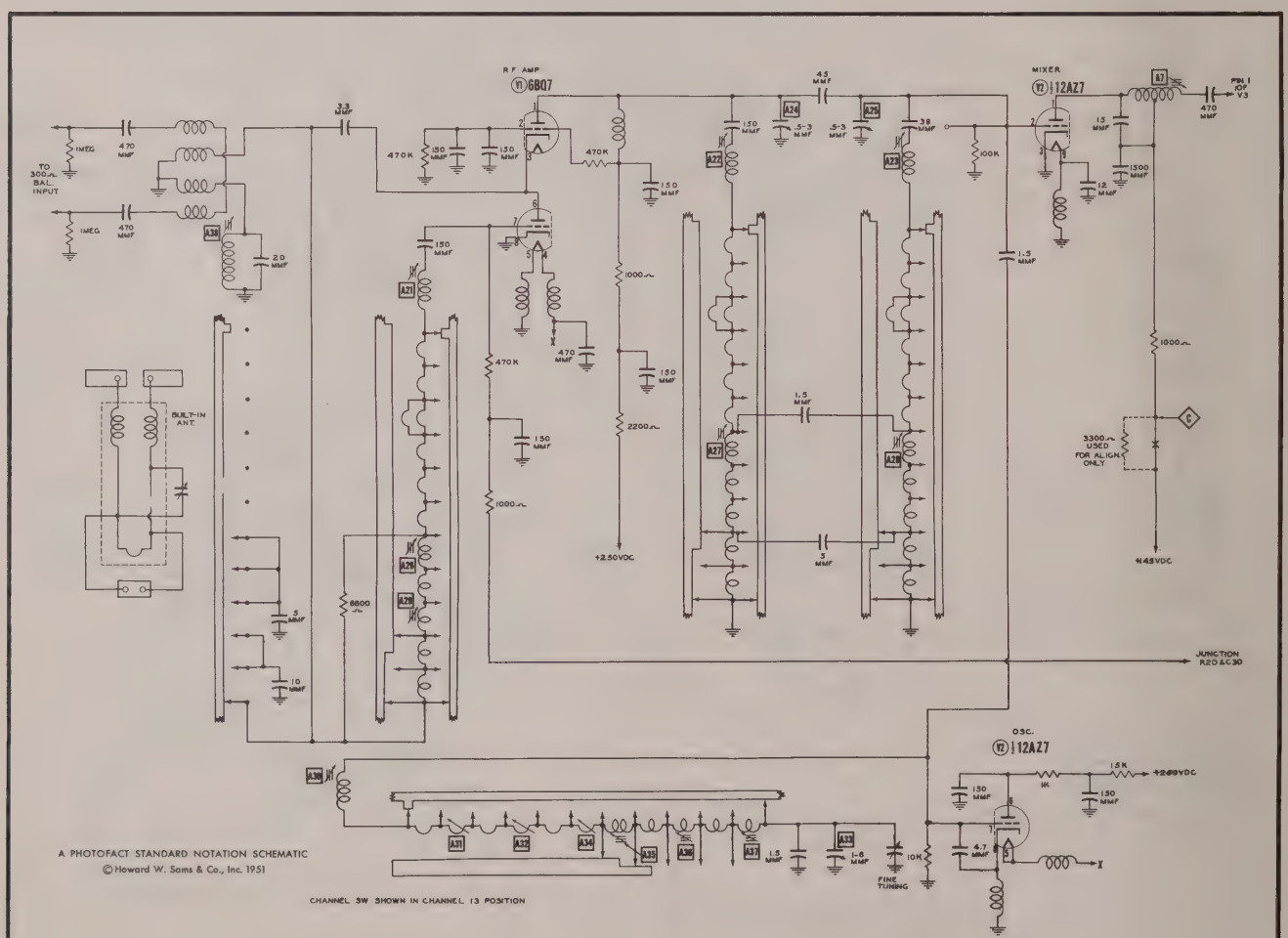


FIG. 6

DISASSEMBLY INSTRUCTIONS

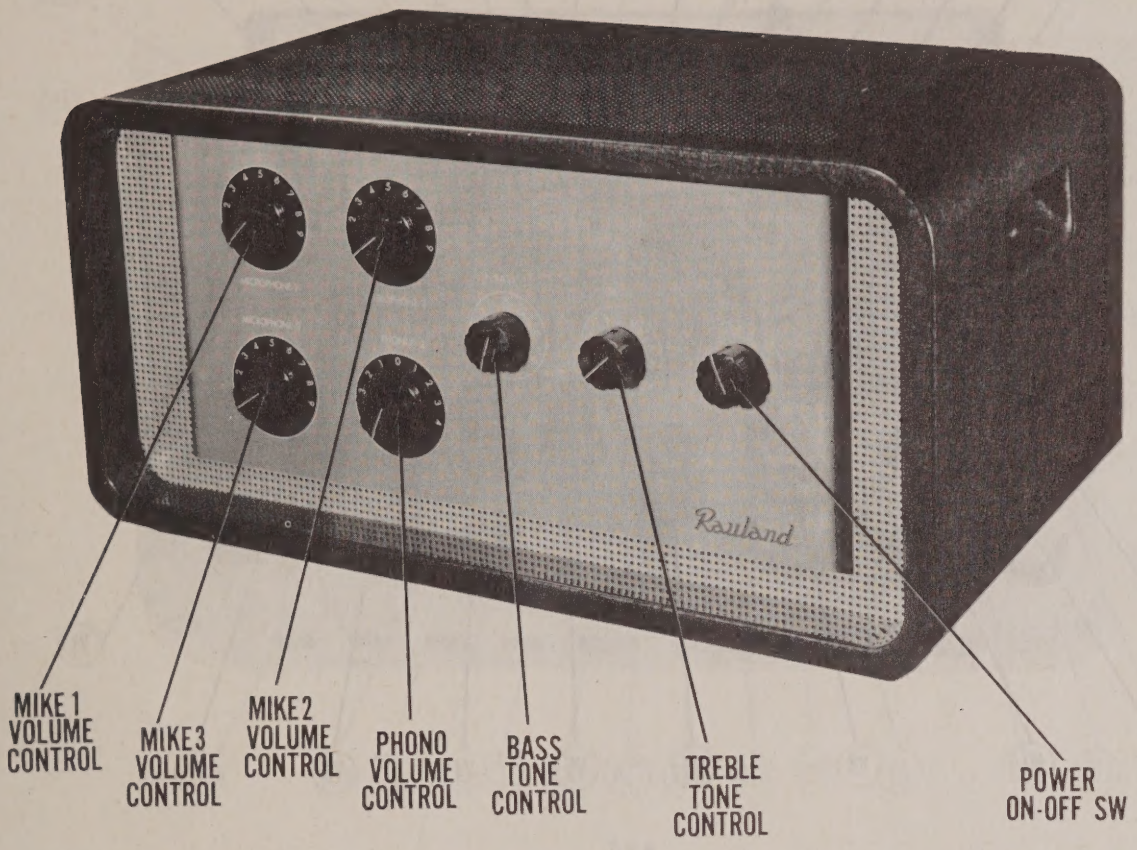
1. Remove seven push-on type control knobs.
2. Remove thirteen metal screws from rear cover. Remove rear cover.
3. Disconnect built-in antenna.
4. Remove antenna terminal strip.
5. Disconnect speaker.
6. Disconnect receiver plug.
7. Disconnect picture tube socket.
8. Disconnect yoke plug.
9. Disconnect volumn control plug.
11. Disconnect HV lead.
12. Remove four 1/4" hex head bolts from receiver.chassis. Remove chassis.
13. Remove five 1/4 ' hex head bolts from power chassis. Remove chassis.
14. Remove four 5/16" hex nuts from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.



ALTERNATE TUNER SCHEMATIC

RAULAND
MODEL 1932



RAULAND
MODEL 1932

RAULAND MODEL 1932

TRADE NAME	Rauland, Model 1932
MANUFACTURER	Rauland-Borg Corp., 3523 W. Addison, Chicago 18, Illinois
TYPE SET	AC Operated Audio Amplifier
TUBES (TEN)	Types 6SQ7 Mic. 1 Amp., 6SQ7 Mic. 2 Amp., 6SQ7 Mic. 3 Amp., 6SC7 Mic. 1 and 2 Amp., 6SC7 6SC7 Mic. 3 and Phono Amp., 6SC7 AF Amp. Phase Inv., (2) 6L6G Power Output, 6X5GT Rectifier, 5U4G Rectifier
POWER SUPPLY	117 or 130 Volts AC RATING 1 Amp. at 117Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

RAULAND MODEL 1932

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RAULAND PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1	Mic #1 Pre-Amp.	6SQ7	6SQ7	8Q	
V2	Mic. #2 Pre-Amp.	6SQ7	6SQ7	8Q	
V3	Mic. #3 Pre-Amp.	6SQ7	6SQ7	8Q	
V4	Mic. 1-Mic 2 Amp.	6SC7	6SC7	8S	
V5	Mic. 3 Amp.-Phono Amplifier	6SC7	6SC7	8S	
V6	AF Amplifier Phase Inverter	6SC7	6SC7	8S	
V7	Power Output	6L6G	6L6G	7AC	
V8	Power Output	6L6G	6L6G	7AC	
V9	Rectifier	6X5GT	6X5GT	6S	
V10	Rectifier	5U4G	5U4G	5T	

CAPACITORS

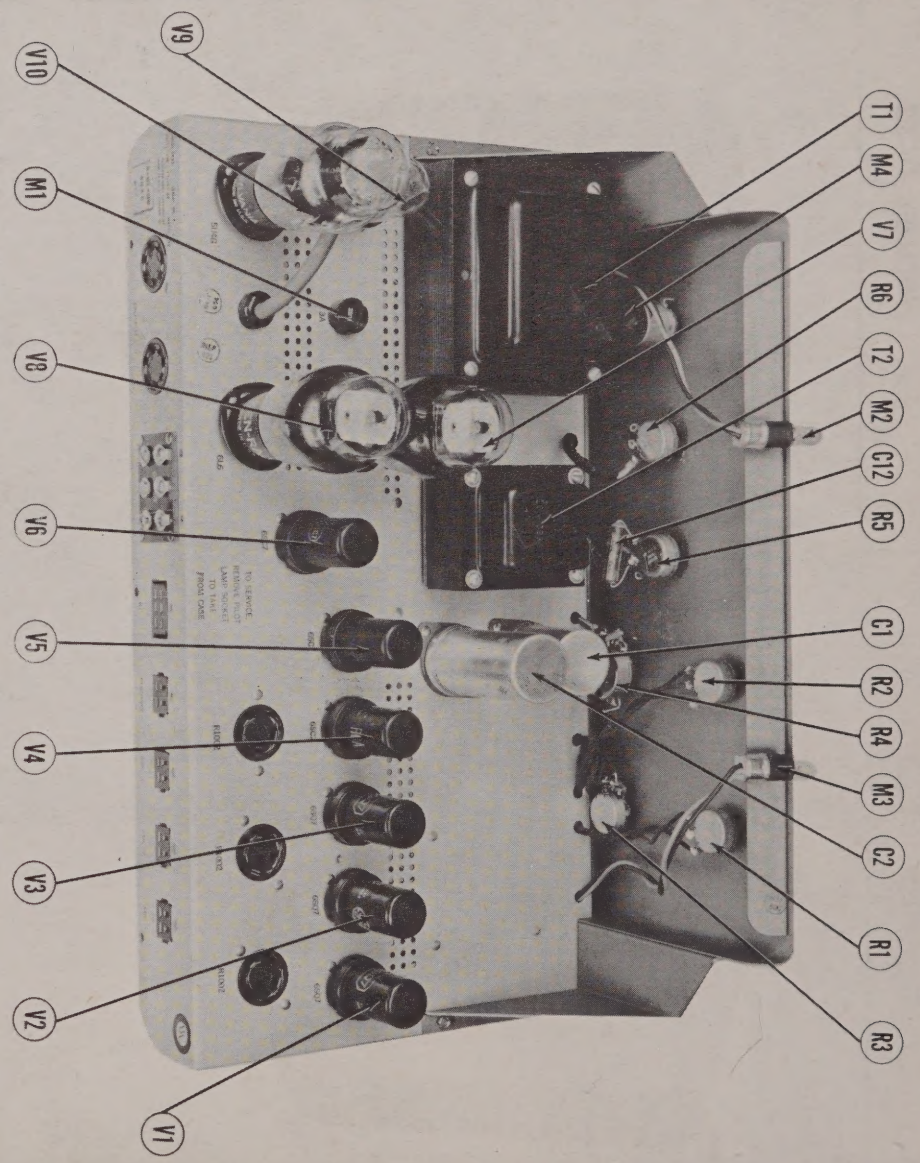
Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RAULAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	30	500	CE-306E	AFH1-60		UP3050		R1152	Filter
C2A	40	450	CE-706A	AFH4-17		UP41145		TVL-4840	▲ Filter
B	10	450							■ Filter
C	10	450							▲ Filter
D	10	450							Filter
C3A	40	25		PRS150/40-40		BRD4415A		TVA-2445	Mic. 1 Pre Amp. Cathode
B	40	25							Mic. 2 Pre Amp. Cathode
C4	40	25		PRS25/50		BR502A		TVA-1206	Mic. 3 Pre Amp. Cathode
C5	8	450		PRS450/8		BR845A		TVA-1704	Decoupling
C6	40	25		PRS25/50		BR502A		TVA-1206	Output Cathode
C7	.022	600		P688-022	DF-203	PTE6S2		6TM-S22	Audio Coupling
C8	.022	600		P688-022	DF-203	PTE6S2		6TM-S22	Audio Coupling
C9	.022	600		P688-022	DF-203	PTE6S2		6TM-S22	Audio Coupling
C10	.047	600		P688-047	DF-503	PTE6S5		6TM-S47	Tone Comp.
C11	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Audio Coupling
C12	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Tone Comp.
C13	.047	600		P688-047	DF-503	PTE6S5		6TM-S47	Audio Coupling
C14	.047	600		P688-047	DF-503	PTE6S5		6TM-S47	Audio Coupling
C15	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Line Filter

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RAULAND PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	1/2	RP-504B	Q13-133	AG-60-Z	BSK-60	Mike 1 Volume Control
B	Shaft			Not req.	KSS-3	Not req.	Attach to R1A per instructions
R2A	500KΩ	1/2	RP-504B	Q13-133	AG-60-Z	BSK-60	Mike 2 Volume Control
B	Shaft			Not req.	KSS-3	Not req.	Attach to R2A per instructions
R3A	500KΩ	1/2	RP-504B	Q13-133	AG-60-Z	BSK-60	Mike 3 Volume Control
B	Shaft			Not req.	KSS-3	Not req	Attach to R3A per instructions
R4A	1Meg	1/2	RP-105A	QVC-539X	AT-112		Phono Volume Control
B	Shaft			Not req.	KSS-3		Attach to R4A per instructions
R5A	2Meg	1/2	RP-205B	Q13-139	AG-66-Z	AN-76	Bass Tone Control
B	Shaft			Not req.	KSS-3	AK-4	Attach to R5A per instructions
R6A	500KΩ	1/2	RP-504B	Q13-133	AG-60-Z	BSK-60	Treble Tone Control
B	Shaft			Not req.	KSS-3	Not req.	Attach to R6A per instructions

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	RAULAND PART No.	IRC PART No.	
R7	2.2Meg	½		BTS-2.2Meg	Mike 1 Pre-Amp. Grid
R8	3300Ω	½		BTS-3300	Mike 1 Pre-Amp. Cathode
R9	470KΩ	½		BTS-470K	Voltage Divider
R10	220KΩ	½		BTS-220K	Mike 1 Pre-Amp. Plate
R11	2.2Meg	½		BTS-2.2Meg	Mike 2 Pre-Amp. Grid
R12	3300Ω	½		BTS-3300	Miek 2 Pre-Amp. Cathode
R13	220KΩ	½		BTS-220K	Mike 2 Pre-Amp. Plate
R14	470KΩ	½		BTS-470K	Voltage Divider
R15	2.2Meg	½		BTS-2.2Meg	Mike 3 Pre-Amp. Grid
R16	3300Ω	½		BTS-3300	Mike 3 Pre-Amp. Cathode
R17	220KΩ	½		BTS-220K	Mike 3 Pre-Amp. Plate
R18	470KΩ	½		BTS-470K	Voltage Divider
R19	47KΩ	1		BTA-47K	Voltage Divider
R20	10KΩ	1		BTA-10K	Voltage Divider
R21	100KΩ	½		BTS-100K	AF Amp. Grid
R22	1000Ω	½		BTS-1000	AF Amp. Cathode
R23	100KΩ	½		BTS-100K	AF Amp. Plate
R24	6800Ω	½		BTS-6800	Phase Inverter Grid
R25	100KΩ	½		BTS-100K	Phase Inverter Plate
R26	220KΩ	½		BTS-220K	Output Grid
R27	220KΩ	½		BTS-220K	Output Grid
R28	250Ω	10		1 3/4A-250	Output Cathode
R29	100KΩ	2		BTB-100K	Balancing
R30	4700Ω	1		BTA-4700	Filter
R31	470Ω	½		BTS-470	Bias Network
R32	10Ω	½			Bias Network
R33	4700Ω	½		BTS-4700	Feedback Network

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	RAULAND PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 1A	680VCT .096ADC	480VCT .015ADC	5VAC @ 3A SEC. 4 6.3VAC @ 4.2A	LP-0173			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		RAULAND PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	4.8KCT	4Ω 8Ω 167Ω 250Ω 500Ω	200Ω CT	.4Ω .5Ω 5.5Ω 7.5Ω 11Ω	LO-0093-A				

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			RAULAND PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG	3A			312003	341001	

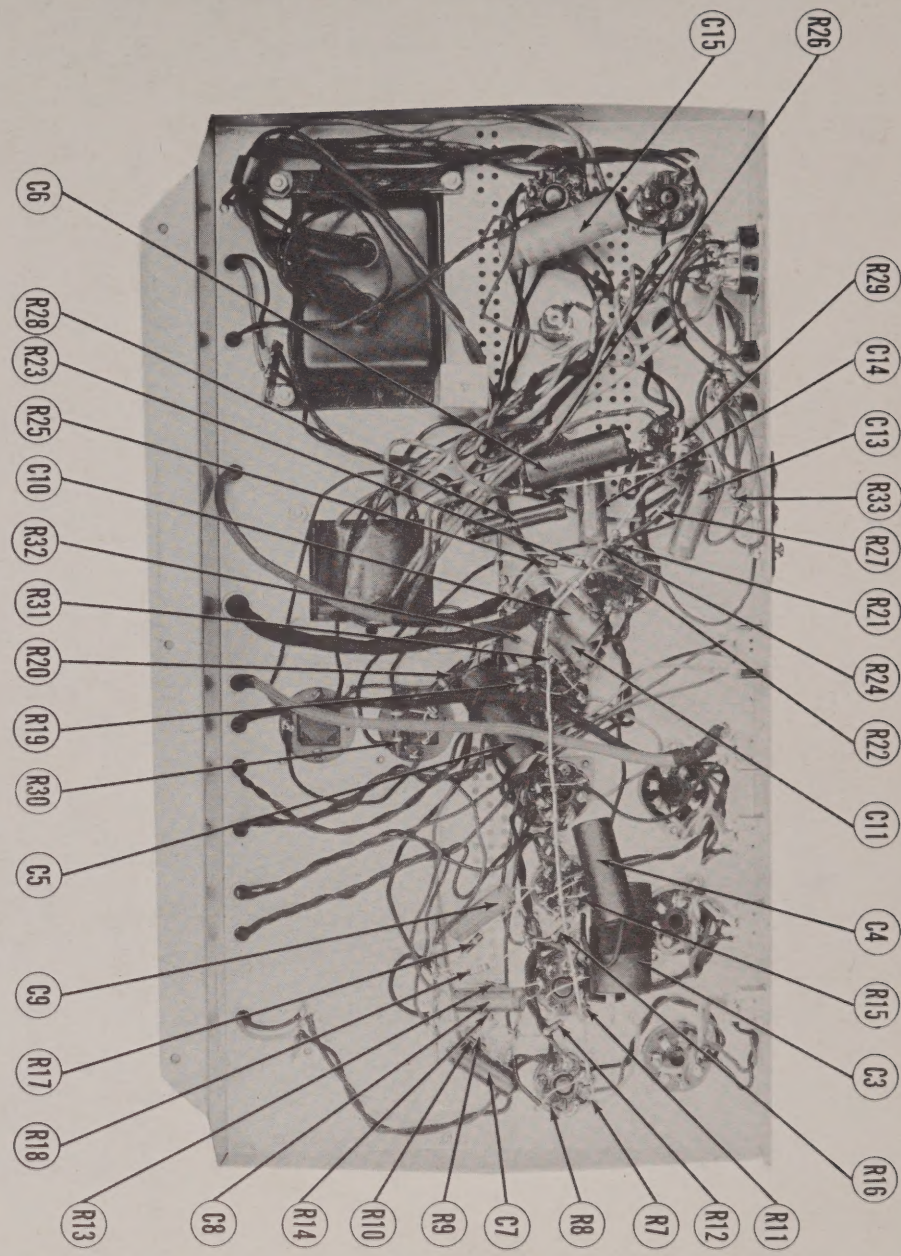
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					RAULAND PART No.		
M2	Bayonet	6-8	.15	Brown			Type # 47
M3	Bayonet	6-8	.15	Brown			Type #47

MISCELLANEOUS

ITEM No.	PART NAME	RAULAND PART No.	NOTES
M4	Switch	X-0235	On-Off

CHASSIS—BOTTOM VIEW

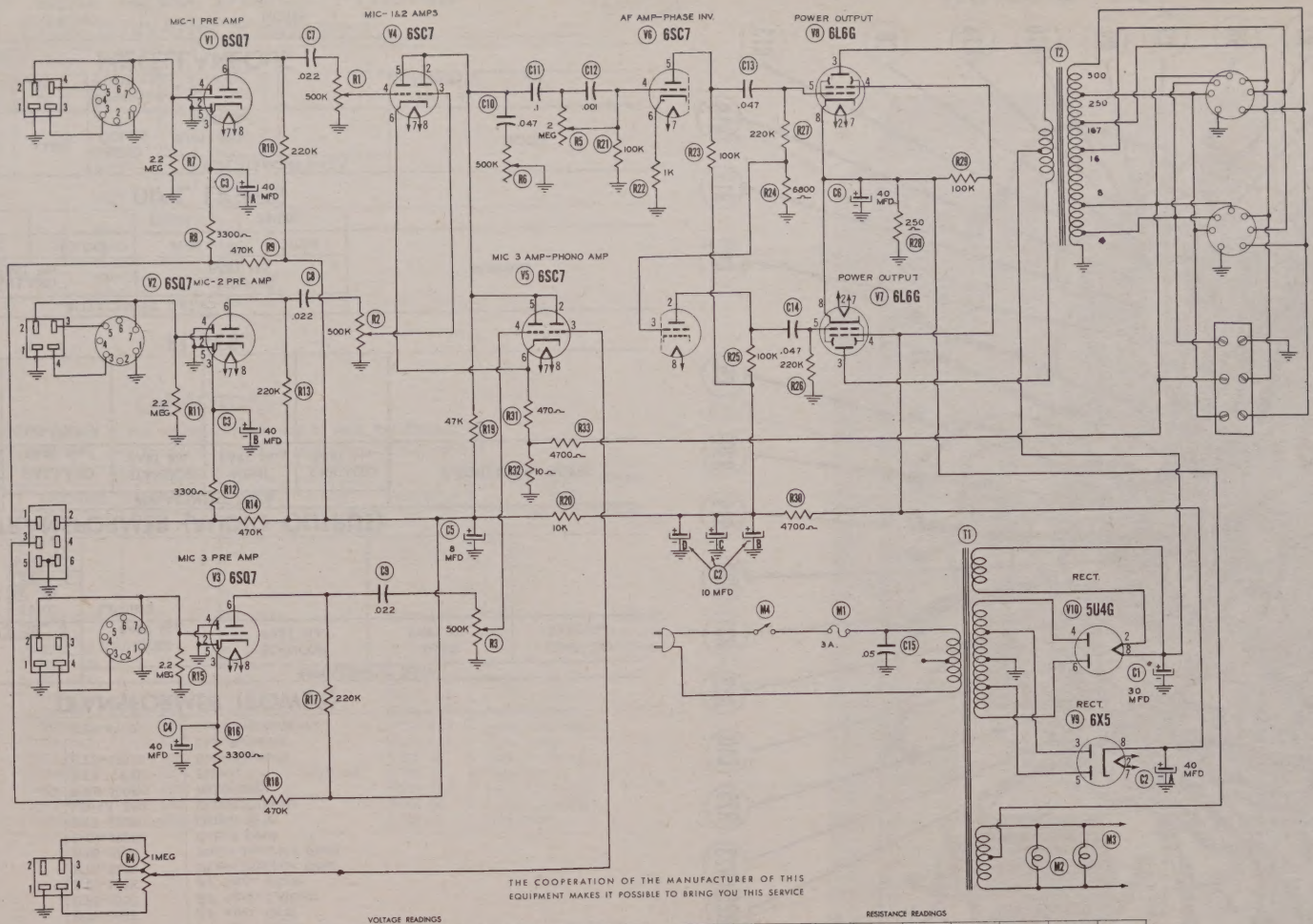


SET 148

FOLDER 14

RAULAND MODEL 1932

RAULAND MODEL 1932



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SQ7	0V	0V	■1.6VDC	0V	0V	■155VDC	¶0V	¶6.3VAC
V 2	6SQ7	0V	0V	■1.6VDC	0V	0V	■155VDC	¶0V	¶6.3VAC
V 3	6SQ7	0V	0V	■1.6VDC	0V	0V	■155VDC	¶0V	¶6.3VAC
V 4	6SC7	0V	120VDC	0V	0V	120VDC	1.4VDC	¶0V	¶6.3VAC
V 5	6SC7	0V	120VDC	0V	0V	120VDC	1.4VDC	¶0V	¶6.3VAC
V 6	6SC7	0V	180VDC	0V	0V	180VDC	2.1VDC	¶0V	¶6.3VAC
V 7	6L6G	0V	¶6.3VAC	415VDC	320VDC	0V	0V	¶0V	25VDC
V 8	6L6G	0V	¶6.3VAC	415VDC	320VDC	0V	0V	¶0V	25VDC
V 9	6X5GT	0V	¶6.3VAC	250VAC	6.3VAC	250VAC	1.1VAC	¶0V	320VDC
V 10	5U4G	0V	420VDC	0V	350VAC	115VAC	350VAC	0V	420VDC

¶ MEASURED FROM PIN 7 OF 8
■ PINS 1, 2, AND 3 ON REMOTE CONTROL SOCKET GROUND FOR THIS MEASUREMENT

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SQ7	0Ω	2.2Meg	■2.7KΩ	0Ω	0Ω	†230KΩ	¶0Ω	¶.1Ω
V 2	6SQ7	0Ω	2.2Meg	■2.7KΩ	0Ω	0Ω	†230KΩ	¶0Ω	¶.1Ω
V 3	6SQ7	0Ω	2.2Meg	■2.7KΩ	0Ω	0Ω	†230KΩ	¶0Ω	¶.1Ω
V 4	6SC7	0Ω	†61KΩ	0Ω	0Ω	†61KΩ	480Ω	¶0Ω	¶.1Ω
V 5	6SC7	0Ω	†61KΩ	550KΩ	0Ω	†61KΩ	480Ω	¶0Ω	¶.1Ω
V 6	6SC7	0Ω	†100KΩ	6.8KΩ	100KΩ	†100KΩ	1KΩ	¶0Ω	¶.1Ω
V 7	6L6G	0Ω	¶.1Ω	▲100Ω	¶0Ω	220KΩ	Inf.	¶0Ω	220Ω
V 8	6L6G	0Ω	¶.1Ω	▲100Ω	¶0Ω	220KΩ	8Ω	¶0Ω	220Ω
V 9	6X5GT	0Ω	¶.1Ω	25Ω	Inf.	27Ω	Inf.	¶0Ω	60KΩ
V 10	5U4G c/c	Inf.	110KΩ	Inf.	42Ω	Inf.	38Ω	Inf.	110KΩ

† MEASURED FROM PIN 8 OF V9
▲ MEASURED FROM PIN 8 OF V10
¶ MEASURED FROM PIN 7 OF V8
■ PINS 1, 2, AND 3 ON REMOTE CONTROL SOCKET GROUNDED FOR THIS MEASUREMENT

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A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1 - DC Voltage measurements are at 20,000 ohms per volt: AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.